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Additional Area 1 and 2 Investigations and Remedial Objectives Report

**The Lockformer Company
Lisle, Illinois**

Clayton Project No.65263.60.12
March 5, 2004

Prepared for:

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1.0 INTRODUCTION

At the request of the Illinois Environmental Protection Agency (Illinois EPA), the Lockformer Company (Lockformer), a division of MetCoil Systems Corporation, submitted the Remedial Action Plan for Areas 1 and 2 (RAP) on July 7, 2003. After this submission, the Illinois EPA requested Lockformer to submit an additional package of information on July 25, 2003 to support the development of the soil remediation objectives (SROs) contained in the July 7, 2003 RAP submittal. Based on these submittals, the Illinois EPA issued comments on the RAP on August 20, 2003. As a result of these comments, discussions between the Illinois EPA and Lockformer representatives were undertaken regarding the geology, hydrogeology, and solute transport processes on the west side of Area 2 of the Lockformer site, and an additional scope of work was developed to provide for additional investigations there. The scope of work regarding these additional investigations on the west side of Area 2 was approved by the Illinois EPA in a letter dated October 24, 2003.

The field investigations on the west side of Area 2 have recently been completed. Representatives of Lockformer and the Illinois EPA have agreed that Lockformer will submit this report on March 5, 2004 that summarizes these investigations and modeling to develop SROs for the upper till and lower till for Areas 1 and 2 at the site. In anticipation of this March 5, 2004 submittal, the Illinois EPA requested Lockformer to respond to the August 20, 2003 comments on the July 7, 2003 RAP, and a dialog to subsequently occur regarding any points of contention in order for the March 5, 2004 submittal to be as complete and final as possible. As a result of this request, Lockformer developed comment responses in the form of a memorandum and submitted those responses to the Illinois EPA on February 16, 2004. Discussions between Lockformer and Illinois EPA representatives subsequently occurred relative to the February 16, 2004 memo submittal that helped define the nature of this report.

1.1 CONCERNS

As a result of discussions contained in the July 7, 2003 RAP submitted by Lockformer, Illinois EPA representatives were concerned about the ability of contaminants migrating along the upper surface of the lower till to offsite locations west of Area 2 prior to entering groundwater saturating the mass waste sand and gravel onsite. An additional concern voiced by the Illinois EPA was related to the lithologic nature of the lower till along the west side of Area 2.

1.2 PURPOSE

The purpose of this report is to present and interpret the results of additional data collection efforts primarily directed at investigating the west side of Area 2 at the site and to present migration to groundwater remedial objectives for the upper till and lower till at the site.

1.3 METHOD OF STUDY

After submitting the July 7, 2003 RAP, discussions were undertaken with Illinois EPA representatives to determine the exact nature of its concern regarding the potential subsurface contaminant transport on the west side of Area 2. The primary focus of the concern was related to the potential for contaminant migration along the upper surface of the lower till across the west property boundary of Area 2 prior to migrating into and mixing with groundwater saturating the mass waste sand and gravel. A second concern was the lithologic nature of the lower till along the west side of Area 2 and its ability to function as an adequate aquitard for vertical migration of contamination to the lower sand and Silurian dolomite.

To address these concerns, it was determined that three additional soil borings would be advanced along the west side of Area 2. These three soil borings (CSB-1853, CSB-1854, and CSB-1855) were continuously split-spoon sampled from surface grade to and through the entire thickness of the lower till. Soil samples acquired at the upper surface of the lower till at each boring were submitted for laboratory analyses of volatile organic compounds (VOCs). Due to the inability to successfully retrieve soil samples throughout critical lithologic intervals during several borings, several attempts to complete each boring were necessary. At one boring location in an attempt to complete the CSB-1855 soil boring, the additional soil boring (labeled CSB-1856) also had a sample of the upper surface of the lower till submitted for laboratory VOC analysis.

Groundwater monitoring wells were completed at the location of soil borings CSB-1853 and CSB-1855 to monitor the upper surface of the lower till to determine if there is an occurrence of groundwater there. A groundwater monitoring well was also installed within the lower till at location MW-1122S to determine the groundwater quality and hydraulic parameters within the lower till along the west side of Area 2. Monitoring well MW-1122S was later sampled to make this groundwater quality determination. Soil boring logs and monitoring well logs from these investigations are provided in Appendix A.

During the investigation of the lower till along the west side of Area 2, Shelby tube and split-spoon samples were acquired and submitted for geotechnical laboratory analyses to determine the lithologic characteristics of the lower till. These geotechnical analyses included the determination of grain size, total organic matter, moisture content, bulk density, and triaxial vertical permeability. The geotechnical laboratory analyses results are provided in Appendix B.

To aid in determining the remedial objectives for the upper and lower till at the site, additional slug testing was performed to estimate hydraulic conductivity in monitoring

wells MW-1114S and MW-1122S. Analysis of these slug tests and other relative slug testing data available for Areas 1 and 2 at the Lockformer site are provided in Appendix C.

1.4 PREVIOUS STUDIES

This report is not intended to be a stand-alone report. It is assumed the reviewer is familiar with the voluminous quantity of reporting performed to date on the site. In particular, it is assumed the reviewer is familiar with the following previously performed studies on the site:

- Interim Investigation Report. January 25, 2001. Volumes 1, 2, and 3. Clayton Group Services, Inc.
- Comprehensive VOC Investigation Work Plan. May 25, 2001. Clayton Group Services, Inc.
- Comprehensive VOC Investigation Report. May 10, 2002. Volumes 1, 2, 3, 4, 5, and 6. Clayton Group Services, Inc.
- Lockformer Work Plan. September 20, 2002 (Volume 1), December 13, 2001 (Volume 2), February 28, 2003 (Volume 3). Clayton Group Services, Inc.
- Supplemental Comprehensive VOC Investigation Report (for Areas 1 and 2). October 18, 2002. Clayton Group Services, Inc.
- Supplemental VOC Investigation Report for Area 3. November 27, 2002. Clayton Group Services, Inc.
- Remedial Action Plan for Areas 1 and 2. July 7, 2003. Clayton Group Services, Inc.

2.0 GEOLOGY

The most recent geologic investigations have focused on defining the nature of site conditions along the west side of Area 2 more specifically. Discussions regarding the general nature of geologic conditions in the vicinity of the Lockformer Site can be reviewed in the reports and references listed in Section 1.4 of this report. These reports also contain a large number of results of geotechnical lithologic analyses of non-carbonate organic carbon, grain-size, moisture content, specific gravity, bulk density, total porosity, air-filled porosity, and water-filled porosity. The results of these lithologic analyses are summarized and identified by lithologic unit in Table 2-1. These lithologic analyses are averaged and summarized by unit in Table 2-2.

2.1 SITE GEOLOGY

The recent geologic investigations on the west side of Area 2 have focused on a more specific determination of the lower till surface occurrence and the lithologic nature and thickness of the lower till. These additional investigations allow a reevaluation of the cross-section F-F' submitted in the *Supplemental Comprehensive VOC Investigation Report* dated October 18, 2002. Figure 2-1 provides the revised cross-section F-F' based on the findings from these recent investigations.

Comparing Figure 2-1 to the old cross-section F-F' results in the following observations:

- A better understanding of the lower till thickness across the Area 2 west boundary. The lower till is approximately 16 feet in thickness across this area of the site.
- The lithologic nature of the lower till along the western boundary of Area 2 can be characterized as grading between silty clay till to silt till based on geotechnical laboratory analyses of grain size. Previous visual description of the lower till lithology in the vicinity of soil boring CSB-1840 as sandy silt till was apparently in error.

- The upper surface of the lower till north of monitoring well nest MW-1114S and MW-1114D is better defined.
- Unsaturated mass waste unit soil conditions were encountered immediately above the lower till in each of the recently installed borings.
- Total organic carbon content of the lower till on the west side of Area 2 as determined from geotechnical laboratory analyses has an 0.42% average.

The most recent data acquisition, and other site data have been used to develop a structural contour surface of the lower till for the site. This structural contour surface is provided as Figure 2-2. The soil boring data used to develop the surface plot are identified on Figure 2-2.

The structural contour surface plot of the upper surface of the lower till was used in conjunction with data available for the contact between the lower till and the upper surface of the lower sand to develop an isopach map of the lower till. The isopach map of the lower till is provided as Figure 2-3. The data points used to identify the contact elevation between the lower till and the lower sand are provided on Figure 2-3.

Figure 2-3 was developed by taking the structural contour surface of the lower till and subtracting from it the contour surface of the lower till contact with the lower sand. A review of Figure 2-3 suggests the lower till ranges in thickness from 6 to 28 feet.

2.2 RECENT SOIL SAMPLING RESULTS

The upper surface of the lower till was sampled at soil boring locations CSB-1853, CSB-1854, and CSB1855 (in two separate borings) and submitted for laboratory analysis of VOCs. A 2-foot sand and gravel was encountered within 2 feet of the upper surface of the lower till in CSB-1855. In order for there to be no question regarding the true impacts to the upper surface of the lower till at this location, an additional sample was acquired for laboratory analysis of VOCs. All four upper surface of the lower till soil samples were determined to be non-detect for all VOCs. Figure 2.1-3 from the July 7,

2003 RAP, which depicts soil sampling results for the upper surface of the lower till, is updated with the new data from CSB-1853, CSB-1854, and CSB-1855 and is provided as Figure 2-4.

3.0 HYDROGEOLOGY

Detailed discussions regarding the hydrogeology and nature of hydrostratigraphic units at and in the vicinity of the Lockformer site have been discussed in several of the reports identified in Section 1.4. As an update to these discussions, two potentiometric surface maps of the Silurian dolomite aquifer have been prepared for the semi-regional area around the Lockformer site. The July 2003 potentiometric surface map for the Silurian dolomite aquifer is provided as Figure 3-1. The February 2004 potentiometric surface map for the Silurian dolomite aquifer is provided as Figure 3-2. The measurements appearing on Figure 3-1 were obtained on July 7, 2003. The measurements appearing on Figure 3-2 were obtained on February 3 and 4, 2004. The potentiometric contours during both measurement periods indicate a southeast flow in the Silurian dolomite aquifer over the semi-regional area.

3.1 SITE HYDROGEOLOGY

3.1.1 Recent Hydrogeologic Investigations

Monitoring wells MW-1853, MW-1855, and MW-1122S were installed on the west side of Area 2 to complete the recent additional investigations there. Monitoring wells MW-1853 and MW-1855 were installed to determine the occurrence of groundwater migrating along the upper surface of the lower till. Monitoring well MW-1122S was installed to determine hydrogeologic parameters and groundwater quality within the lower till along the west side of Area 2.

Prior to drilling and installing the monitoring wells, exploratory soil borings were drilled at each location. During the drilling of soil borings CSB-1853 and CSB-1854, the contact between the mass waste and lower till was determined, and the hollow stem augers were withdrawn to one foot above the contact. The augers were maintained in this

position for 24 hours to allow any water present in the mass waste to accumulate in the sump in the lower till surface. Both borings were determined to be dry after the 24-hour period. The same procedure to assess groundwater occurrence in the mass waste unit was employed during the drilling of CSB-1855 except the augers were withdrawn and allowed to sit over the weekend to determine if water would accumulate in the borehole. The contact between the mass waste and lower till was also determined to be dry in CSB-1855 after being allowed to sit over the weekend. After dry conditions were determined in the mass waste unit on top of the lower till at soil borings CSB-1853, CSB-1854, and CSB-1855, the borings were advanced through the full thickness of the lower till. Each boring was then abandoned by tremie-grouting the borehole with high-solids bentonite grout to surface grade.

Monitoring wells MW-1853 and MW-1855 were installed at locations directly adjacent to the previous soil borings of similar description. During the drilling of all three wells, no saturation was observed in the mass waste sand and gravel sediments immediately on top of the lower till surface. Since installation, both wells have been dry. However, recently MW-1853 indicated a standing water column of 0.7 feet in the well. It is believed this occurrence of water is due to condensation within the well collecting in the sump drilled into the lower till at this location.

Monitoring well MW-1122S was drilled adjacent to MW-1122 and installed with a 2-foot well screen completed in the lower till. The completion of MW-1122S in this manner provides a determination of the groundwater quality and hydrostatic head within the lower till. The MW-1122S location was chosen based on previous exploratory borings in this area indicating a more permeable transitional zone in the lower till predominantly characterized by silt lithologies. As a result, it can be expected that greater horizontal and vertical transport might take place through this area of the lower till. To further analyze this potential, two Shelby tube samples were acquired from the lower till during the drilling of MW-1122S and submitted for vertical permeability determination by

triaxial chamber method. These results are summarized in Table 3-1 and suggest the vertical permeability of the lower till in this portion of the site is approximately 3×10^{-7} cm/sec.

In addition to the laboratory vertical permeability testing performed at MW-1122S, hydraulic conductivity tests by the slug method were performed at MW-1122S and MW-1114S to determine the horizontal hydraulic conductivity in the lower till and lower sand. The data from these slug tests are presented in Appendix C. The results from these slug tests are summarized in Table 3-1.

3.2 RECENT GROUNDWATER SAMPLING RESULTS

Since the July 7, 2003 RAP, only one new monitoring well has been installed in Areas 1 and 2. During this period, no groundwater grab samples were collected in Areas 1 and 2. Monitoring well MW-1122S was installed to determine the groundwater quality within the lower till on the west side of Area 2. The groundwater sample analysis for detected VOCs at monitoring well MW-1122S and the most recent groundwater analysis results of detected VOCs in all the monitoring wells in Areas 1 and 2 are provided on Figure 3-3.

3.3 GROUNDWATER FLOW

3.3.1 Groundwater Flow in the Mass Waste Unit

The occurrence of groundwater within the mass waste sand and gravel sediments in Areas 1 and 2 was evaluated using the structural contour surface map (Figure 2-2) and the static water levels recorded for the site (Table 3-2). Through an evaluation of the static water levels for wells completed in the mass waste unit in Areas 1 and 2, it appears the October 17, 2001 measurement date exhibits the most elevated water table condition recorded at the site. The static water levels from this date are plotted adjacent to the

wells from which they were measured and superimposed on the structural contour surface of the lower till to identify the extent of the water table condition in the mass waste unit sediments. This illustration is provided as Figure 3-4.

A review of Figure 3-4 indicates the mass waste unit sediments immediately above the lower till are generally saturated south of an irregularly shaped line that runs east to west from approximately monitoring well MW-522 along the west side of Area 2 to just north of the Bill Kay retention basin to the east. This "high water mark" in the water table condition occurs from an approximate elevation of 655 along the west side of Area 2 to an elevation of approximately 658 just north of the Bill Kay retention basin. The saturated thickness of the mass waste sediments in Areas 1 and 2 can be approximated through comparison of the structural contour surface of the lower till and the static water levels measured in groundwater monitoring wells. The extent of the water table occurrence in the mass waste unit in Areas 1 and 2 has been used to interpret and develop the potentiometric surface maps for the mass waste unit in Areas 1 and 2.

The groundwater flow at the Lockformer site has been assessed through collecting and analyzing static water levels in groundwater monitoring wells completed in similar hydrostratigraphic units. The static water levels have been acquired on an approximate quarter-calendar-year basis. All the static water levels and surface water gage station measurements collected at the site to date are summarized in Table 3-2. Figure 3-5 presents the potentiometric surface map for the mass waste unit glacial sediments on November 8, 2002. Figure 3-6 presents the potentiometric surface map for the mass waste unit glacial sediments on March 8, 2003. Figure 3-7 presents the potentiometric surface map for the mass waste unit glacial sediments on July 7, 2003. Figure 3-8 presents the potentiometric surface map for the mass waste unit glacial sediments on February 4, 2004. Potentiometric surface maps were not developed for the September 24, 2003 data due to inaccessibility of data on the Ogden Corporate Center property.

From a review of the potentiometric surface maps developed for the mass waste unit sediments, the following can be observed:

- A groundwater recharge mound occurs on the east side of the Ogden Corporate Center property in the vicinity of monitoring wells MW-1112S and MW-1123. It is unlikely this is a natural occurrence and most likely is the result of leaks from either the storm sewers on the Ogden Corporate Center property or the Village of Lisle water line that runs north to south along the west side of Area 2. The consistency of the mound occurrence throughout the recent measurements suggests the cause may be a leak in the Village of Lisle water line on the west side of Area 2.
- The development of the structural contour map of the lower till surface (Figure 2-2) provides an appropriate basis by which to approximate the changing size of the unsaturated portion of the mass waste sediments associated with the structural high in the lower till in the vicinity of monitoring well MW-1105D. This has resulted in a better understanding of the groundwater flow in the west portion of Area 2 at the site.
- It appears the Bill Kay retention basin provides additional recharge to the mass waste unit sediments.
- The definition of the extent of the mass waste unit water table on the lower till surface and the saturated thickness of the mass waste sediments provide a better understanding of the groundwater flow within the mass waste unit sediments.

An evaluation of the hydraulic gradient across Areas 1 and 2 in the saturated mass waste unit sediments is available from the static water level data and the potentiometric surface maps. The hydraulic gradient on the southern portion of Area 2 east of the structural high in the lower till surface was performed through simple calculation by using MW-1101S and MW-1113S. Monitoring well MW-1101S is almost directly upgradient of monitoring well MW-1113S. The static water level data in these two wells indicate the hydraulic gradient from November 2002 through February 2004 ranged from 0.0024 to 0.0035 and averaged 0.0028.

For the same period, the hydraulic gradient along the west side of Area 2 north of the structural high in the lower till surface was evaluated using the static water level measurements in monitoring well MW-1117 and the location of the first contour

southwest of the structural high in the lower till. (The location of this contour is deemed reasonably accurate based on the monitoring well coverage determining its location.) The hydraulic gradient analysis performed on this basis indicates that between November 2002 and February 2004 the hydraulic gradient ranged from 0.00085 to 0.002 and averaged 0.0016.

The slug test hydraulic conductivity data for the mass waste unit sand and gravel in Appendix C have been summarized and evaluated in Table 3-1. A review of Table 3-1 indicates geometric mean (lognormal mean) for the hydraulic conductivities in the mass waste unit in Areas 1 and 2 is 1.52×10^{-3} cm/sec. By assigning a reasonable value for the effective porosity of the mass waste unit sediments of 0.25, a calculation of the average linear groundwater velocity in the two primary flow directions can be made. For the southern portion of Area 2 east of the structural high in the lower till surface, the average linear groundwater velocity is approximately 17.5 feet per year:

$$V = k * I * 1/n$$

K = hydraulic conductivity, 1.52×10^{-3} cm/sec or 4.3 ft/day
 I = hydraulic gradient, 0.0028
 N = porosity, 0.25

$$V = 4.3 \text{ ft/day} * 0.0028 * 1/0.25 = 0.048 \text{ ft/day or } 17.5 \text{ ft/yr}$$

For the west side of Area 2 north of the structural high in the lower till surface, the average linear groundwater velocity is approximately 10 feet per year:

$$V = k * I * 1/n$$

K = hydraulic conductivity, 1.52×10^{-3} cm/sec or 4.3 ft/day
 I = hydraulic gradient, 0.0016
 N = porosity, 0.25

$$V = 4.3 \text{ ft/day} * 0.0016 * 1/0.25 = 0.028 \text{ ft/day or } 10 \text{ ft/yr}$$

3.3.2 Groundwater Flow in the Lower Sand and Silurian Dolomite

The lower sand has been determined to exist above the Silurian dolomite at each location in the vicinity of the source areas present in Areas 1 and 2. These two hydrostratigraphic units are in direct hydraulic communication with one another. In Areas 1 and 2 and its close proximity, four locations have a well completed in both the lower sand and the Silurian dolomite at the same well nest. These well nests are MW-1103M and MW-1103D; MW-1108S and MW-1108D; MW-1110S and MW-1110D; and MW-1114S and MW-1114D. All of the monitoring wells completed in the lower sand have at least a portion of the screen completed in the upper weathered surface of the Silurian dolomite.

Figure 3-9 presents the potentiometric surface map developed from static water level measurements in monitoring wells completed in the Silurian dolomite at and in the vicinity of the Lockformer Site on July 7, 2003. Figure 3-10 presents the potentiometric surface map developed from static water level measurements in monitoring wells completed in the Silurian dolomite at and in the vicinity of the Lockformer site on February 4, 2004. These potentiometric surface maps indicate the groundwater flow in Areas 1 and 2 in the Silurian dolomite is generally to the southeast with a hydraulic gradient of approximately 0.0006 to 0.0007.

A slug test was performed in monitoring well MW-1114S to determine the hydraulic conductivity. This well was identified for testing due to its well screen having been completed only one foot into the dolomite surface and, as a result, best characterizes the hydraulics in the lower sand. The slug test results from monitoring well MW-1114S indicate a hydraulic conductivity of approximately 5×10^{-3} cm/sec. Assuming a hydraulic gradient equivalent to that of the Silurian dolomite across the site and an effective porosity of 0.25, an approximation of the average linear groundwater velocity in the lower sand can be made. These calculations suggest an average linear groundwater velocity in the lower sand in Areas 1 and 2 of approximately 13 feet per year:

$$\begin{aligned}
 V &= k * I * 1/n \\
 K &= \text{hydraulic conductivity, } 5 \times 10^{-3} \text{ cm/sec or } 14 \text{ ft/day} \\
 I &= \text{hydraulic gradient, } 0.00065 \\
 N &= \text{porosity, } 0.25 \\
 V &= 14 \text{ ft/day} * 0.00065 * 1/0.25 = 0.036 \text{ ft/day or } 13.3 \text{ ft/yr}
 \end{aligned}$$

Likewise, the flow rate through the lower sand in the vicinity of monitoring well MW-1114S per unit width of aquifer can be estimated as follows:

$$\begin{aligned}
 Q &= k * i * A \\
 \text{Where,} \\
 Q &= \text{aquifer flow rate per unit width of aquifer} \\
 K &= \text{hydraulic conductivity, } 5 \times 10^{-3} \text{ cm/sec, or } 14 \text{ ft/day} \\
 I &= \text{hydraulic gradient, } 0.00065 \\
 A &= 12\text{-foot thickness of the lower sand at monitoring well MW-1114S per unit width of aquifer.} \\
 Q &= 14 \text{ ft/day} * 0.00065 * 12 \text{ ft}^2 = 0.11 \text{ ft}^3/\text{day or } 40 \text{ ft}^3/\text{year (per unit width of aquifer)}
 \end{aligned}$$

3.3.3 Groundwater Flow within the Lower Till

The fact there is a significant difference in the groundwater flow direction and hydraulic gradient between the mass waste sand and gravel and the lower sand/Silurian dolomite indicates the lower till functions as a good aquitard in Areas 1 and 2 at the Lockformer site. The ability of the lower till to function as a good aquitard is also supported through evaluation of the contaminant transport data for the site. Groundwater monitoring results for the lower sand and Silurian dolomite in Areas 1 and 2 indicate there has been no verifiable detection of any site constituents in the lower sand or Silurian dolomite during groundwater monitoring to date.

The vertical hydraulic gradient from the mass waste unit to the Silurian dolomite in and around Areas 1 and 2 is available for measurement at six monitoring well nests: MW-1100S and MW-1100D; MW-1101S and MW-1101D; MW-1102S and MW-1102D;

MW-1103S and MW-1103D; MW-1104S and MW-1104D; and MW-1112S and MW-1112D. The static water level measurements recorded from these wells have been compiled for analysis and are provided as Table 3-3. Table 3-3 provides an arrow indicating the vertical direction of the hydraulic gradient for each measurement event and the corresponding vertical hydraulic gradient computed across the thickness of the lower till at each monitoring well nest location. From observation of Table 3-3, it can be seen that the vertical hydraulic gradient across the lower till in Areas 1 and 2 of the site has ranged from 0.021 to 0.065. The geometric mean of the values is 0.044.

Recently, monitoring well MW-1122S was installed in a nest with previously existing MW-1122. The center of the 2-foot well screen in MW-1122S is located 6 feet below the top of the 18-foot lower till sequence at this location. From the recent water levels recorded on February 4, 2004, these data suggest a vertical hydraulic gradient of 0.056 measured within the lower till at this location. This value is within the range of measured vertical gradients summarized in Table 3-3, which are indicative of the vertical gradients from the mass waste unit to the lower sand/Silurian dolomite.

Slug testing was performed in monitoring well MW-1122S to estimate the horizontal hydraulic conductivity of the lower till. The results of this slug testing are provided in Appendix C, and a summary of the horizontal hydraulic conductivity results for the lower till appears in Table 3-1. Laboratory vertical permeability determinations were made on Shelby tube samples acquired during the drilling of monitoring well MW-1122S. The vertical permeability testing is provided in Appendix B, and a summary of the vertical permeability results appear in Table 3-1. The average of the vertical permeability tests performed on the Shelby tube samples from the lower till was 2.9×10^{-7} cm/sec. Monitoring well MW-1122S was chosen as the location to perform this vertical permeability testing due to its appearing to be a transitional sequence in the lower till grain-size. Visual observation of the lower till lithology at other locations across Areas 1 and 2 suggested lower permeabilities are likely associated with the lower till.

A calculation of the vertical groundwater flow velocity through the lower till can be made with the porosity determination for the lower till of 0.36 available from Table 2-2. This vertical average groundwater velocity would be applicable only to saturated conditions within the lower till. In locations where the mass waste unit sediments are not saturated above the lower till, the lower till exhibits saturated conditions within 4 to 6 feet of its surface across Areas 1 and 2. Based on these data, the vertical average linear groundwater velocity within the saturated portion of the lower till is approximately 0.047 feet per year:

$$V = k_v * I * 1/n$$

k_v = vertical hydraulic conductivity, 2.92×10^{-7} cm/sec or 8.2×10^{-4} ft/day

I = hydraulic gradient, 0.056

N = porosity, 0.36

$$V = 8.2 \times 10^{-4} \text{ ft/day} * 0.056 * 1/0.36 = 0.00013 \text{ ft/day or } 0.047 \text{ ft/yr}$$

The very low vertical groundwater velocity through the lower till and the lack of observed contaminant migration through it as determined from groundwater monitoring at the Lockformer site suggest that horizontal transport in the lower till may be significant. After infiltration into the unsaturated upper surface of the lower till occurs, water migrates downward into the lower till until saturated conditions occur (generally 4 to 6 feet from the lower till surface). The horizontal transport component of flow within the lower till can then be assumed to discharge laterally into the mass waste unit with the potentiometric surface in the lower till generally being parallel to the structural contour surface of the lower till. A north-to-south cross-section conceptual and groundwater flow net through approximately the middle of Area 2 has been developed to illustrate this concept. The cross-section reference line is identified on Figure 3-11, and the cross-section appears on Figure 3-12.

A review of the structural contour surface of the lower till on Figure 3-11 indicates the horizontal flow component in the lower till dictated by that surface is predominantly toward the south to the saturated condition within the mass waste unit. Horizontal flow

within the lower till could be expected to be from the structural high in the lower till contour surface to the north to the water table condition within the mass waste unit to the south. This description of the groundwater flow within the lower till is illustrated conceptually in Figure 3-12 using a flow net diagram. Figure 3-11 illustrates four lines from the structural divide on top of the lower till to the maximum water table extent identified in the mass waste unit. A reasonable estimate of the horizontal hydraulic gradient within the lower till would be to assume saturated conditions occur at a depth of 2 feet below the till surface at the structural high locations and grade to the water table in the mass waste unit laterally. This is visually depicted by the flow net diagram on Figure 3-12. Using this assumption, the topographic slope for each line is computed on Figure 3-11, and the average hydraulic gradient within the lower till over a large portion of Area 2 is estimated to be 0.071.

Using the average estimated hydraulic gradient based on the computed topographic slope of the unsaturated surface of the lower till, the average horizontal linear groundwater flow velocity within the lower till toward the mass waste unit can be estimated. This estimate is as follows:

$$V = k * I * 1/n$$

Where,

V = average horizontal linear groundwater velocity

K = hydraulic conductivity, 1.52×10^{-5} cm/sec or 15.7 ft/year (slug test MW-1122S)

I = hydraulic gradient, 0.071 (described above)

N = porosity, 0.36 (average of measured site data, Table 2-2)

$$V = 15.7 \text{ ft/yr} * 0.071 * 1/0.36 = 3.10 \text{ ft/year or } 0.26 \text{ cm/d}$$

A comparison of the horizontal and vertical groundwater velocities calculated above for the lower till suggests the horizontal groundwater velocity is nearly two orders of magnitude greater than the vertical groundwater velocity and is the dominant component of flow in the lower till.

4.0 RECOMMENDATIONS

A review of Figure 2-2 indicates that Soil Boring CSB-1817 occurs in an isolated depression in the surface of the lower till and is similar but smaller than the one that exists near MW-500D. The depression near MW-500D was described in the text and depicted in cross-section C-C' in the October 18, 2002 *Supplemental Comprehensive VOC Investigation Report*. Special consideration was given to this area in the RAP where groundwater containment was specified for the area around MW-500D (CSB-1829).

It is likely the depression in the upper surface of the lower till near CSB-1817 accumulates precipitation infiltration. Because of this depression's proximity to the Area 2 source area, further investigation is merited. Accordingly, Lockformer will perform a soil boring at the location of former soil boring CSB-1817 and collect a groundwater grab sample from the saturated zone within the mass waste unit above the lower till for laboratory analysis of site contaminants. If the groundwater analytical results from this sample merit further consideration of this area, the feasibility study will consider this when evaluating the remedial options necessary for effective implementation.

5.0 REMEDIAL OBJECTIVES

The previous studies performed at the Lockformer site to define the extent of contamination in soil and groundwater are identified in Sections 1.0 through 3.0 of this report. The nature of groundwater flow at the Lockformer site has also been described by previous reports and is updated with significant further definition in Section 3.0 of this report. The data and interpretations presented form the basis for developing Soil Remedial Objectives (SROs) in this section. Per recent conversations between Lockformer and Illinois EPA representatives, it is the intent of Lockformer to establish the Soil Component of the Groundwater Ingestion Exposure Route or Groundwater Remedial Objective (GWRO) through Tier 2 analyses according to guidance in Title 35 Illinois Administrative Code (IAC) Part 742 *Tiered Approach to Corrective Action Objectives* (TACO)(35 IAC 742).

5.1 UPPER FILL/TILL SILTY CLAY

An evaluation has been conducted on the upper fill/till silty clay unit in Areas 1 and 2 of the Lockformer site in an effort to develop final soil remediation objectives (SROs) that provide for the adequate protection of human health and the environment. The evaluation was conducted in accordance with the guidance established in Title 35 IAC, Part 742 TACO(35 IAC 742).

The Removal Action Objectives (RAOs) for the site were established as part of the USEPA Removal Action Plan and are presented in Table 3.0-1 of the *Lockformer Work Plan* (September 20, 2002). The RAOs are based on the industrial/commercial worker SRO for the inhalation pathway contained in Appendix B, Table B of 35 IAC 742. Considering the final SRO developed for the subject area cannot exceed the established RAOs, the health risk-based evaluation was focused on those exposure routes that would result in remediation objectives below the RAOs. Based on the RAO requirements, the

application of an environmental land use control that restricts the property to industrial/commercial use has been assumed.

5.1.1 Extent of Contamination

The extent of contamination was determined by evaluating the laboratory analytical results for each soil sample collected in Areas 1 and 2 (Figure 5.1-1). Due to the extensive recent investigations conducted in these areas, soil samples collected by previous consultants were given little weight in the extent of contamination evaluation. Those analyses that identified concentrations of contaminants of concern (COCs) exceeding the most conservative SRO established in 35 IAC 742 ("delineation objective," Table 5.1-1) were included in the lateral extent of the area of contamination. Additionally, for those compounds primarily identified above the delineation objectives (cis-1,2-dichloroethene [cis-1,2-DCE], trans-1,2-dichloroethene [trans-1,2-DCE], trichloroethene [TCE], tetrachlorethene [PCE], 1,1,1-trichloroethane [1,1,1-TCA], vinyl chloride [VC], and toluene), sample analyses were also included in the lateral extent of contamination when elevated laboratory detection limits exceeded the delineation objectives.

The evaluation resulted in the development of seven individual extent of contamination configurations, one for each COC (cis-1,2-DCE, trans-1,2-DCE, TCE, PCE, 1,1,1-TCA, VC, and toluene) identified above delineation objectives. The configurations are illustrated in Figures 5.1-2 through 5.1-8. A review of the figures reveals a pattern of impacts typically occurring in three individual zones: the former fill pipe area, the former vapor degreaser area, and the eastern portion of Area 2.

5.1.2 Tier 2 Calculation Methodology

A Tier 2 analysis has been conducted using the Soil Screening Level (SSL) procedures in accordance with 35 IAC 742.710 (d) to address the “Soil Component of the Groundwater Ingestion Route” for Areas 1 and 2 of the Lockformer site. The calculation of the Tier 2 equations was performed using “Taco Plus!” software as developed by ATR Associates of Arlington, Virginia. This program was developed to aid in the evaluation of soil and groundwater cleanup levels according to 35 IAC Part 742.

5.1.2.1 *Soil Component of the Groundwater Ingestion Exposure Route*

An evaluation was conducted on each subject COC in a manner that would determine the concentration that could remain in the soil (given the extent of contamination configurations identified in Figure 5.1-2 through 5.1-8) and still satisfy the Class I groundwater objective at the point of compliance (downgradient site limit). Additionally, an evaluation was conducted on each individual zone of impact (the former fill pipe area, the former vapor degreaser area, and the eastern portion of Area 2) for each COC (as applicable) to provide a more realistic determination of any potential risks by incorporating site conditions specific to that area (i.e., groundwater flow direction, distance to downgradient site limit, etc.).

Each evaluation was conducted in the following manner:

1. In accordance with 35 IAC 742.710 (d)(1)(C), equation R26 was used to determine applicable groundwater objectives (GW_{obj}) at the downgradient edge of each impacted area (identified as GW_{source} in the R26 equation), given Class I groundwater objectives would be satisfied at the downgradient property limit. The source geometry and distance to downgradient property limit information for each COC is illustrated in Figures 5.1-9 to 5.1-14.

For the R26 calculation, a site-specific aquifer hydraulic conductivity value (K) of 1.52×10^{-3} cm/sec (Table 3-1) and an average aquifer thickness of 2 meters (~6 feet)

were used. A value of 0.6 meters (~2 feet) was used for the “Source Width Perpendicular to Groundwater Flow Direction in the Vertical Plane” (S_d). This value is equal to the mixing zone depth (d) determined for the site. The 0.6-meter mixing zone depth was the topic of discussion with Illinois EPA representatives on several occasions and has been selected by Lockformer as a reasonable representation of site conditions. Other physical parameters used in the R26 calculation include a total soil porosity (ϕ_T) of the mass waste sand and gravel ($0.28 \text{ cm}^3/\text{cm}^3_{\text{soil}}$) and hydraulic gradient (0.0016 for the Area 2 zone of impacts and 0.0028 for the former fill pipe and former vapor degreaser zones of impact) (Figure 5.1-15). More detailed information to support the groundwater transport evaluation is presented in Table 5.1-2.

To provide additional conservatism to the model, the TACO Plus! software calculated the point at which the dispersion in the z-direction was equal to the aquifer thickness. At this point, no further dispersion in the z-direction was allowed. This dispersion limit provides for a more “realistic” (conservative) model, especially given the lower confining conditions of the aquifer provided by the lower till. (Figure 5.1-15).

The fate of the constituent is a function of its dispersion in the aquifer and its decay over time. The second two terms (the error function terms) in R26 account for dispersion, while the first term (exponential term) addresses the decay of the constituent. The degree to which the constituent will decay is a function of time. The length of time for decay is the time it takes the constituent to travel from the source area to the point of compliance. Currently, TACO implicitly assumes the constituent travels at the same rate as the groundwater. This rate is known in TACO as the “specific discharge” (U) and is present in the denominator of the radical in the exponential term.

TACO Plus! provides for the use of a “retardation factor” (R_f) to modify the specific discharge (U) to better represent the rate at which the contaminant moves through the saturated zone. However, for the purposes of this evaluation, the rate of contaminant movement was considered equivalent to the rate of groundwater to provide another level of conservatism to the model.

2. Soil source concentrations that would result in the GW_{obj} concentrations (calculated in Step #1) were determined in accordance with 35 IAC 742.710 (d) using equations S17, S18, S19, and S22 located in 35 IAC 742, Appendix C, Table A: SSL Equations.

Site-specific parameters used in the SSL equations common to multiple calculations include water-filled soil porosity ($0.353 \text{ L}_{\text{water}}/\text{L}_{\text{soil}}$), air-filled soil porosity ($0.026 \text{ L}_{\text{air}}/\text{L}_{\text{soil}}$), dry soil bulk density (1.72 g/cm^3), and organic carbon content of soil (0.7%) (Figure 5.1-15). The values were calculated using the applicable data

presented in Table 2-1 and averaged in Table 2-2. More detailed information to support the SSL calculations is presented in Table 5.1-3.

In accordance with the Tier 2 parameter options presented in 35 IAC 742, Appendix C, Table B: SSL Parameters, a value of 20 was selected as the dilution factor (DF) in equation S22.

In the instance that the calculated GW_{obj} concentrations exceeded the solubility limit of the chemical in water (S) or the SRO exceeded the soil saturation limit (C_{sat}), Taco Plus! used default value equal to the calculated site-specific S and C_{sat} concentrations for each chemical. Solubility Limits were obtained from 35 IAC742 Appendix C Table E. Site-specific C_{sat} concentrations are presented in Table 5.1-3.

5.1.2.2 *Cumulative Effects*

The COCs were evaluated to determine if the cumulative effects of carcinogenic and non-carcinogenic compounds would require consideration. According to Appendix A, Table E of TACO, cis-1,2-DCE and trans-1,2-DCE have cumulative non-carcinogenic effects on the circulatory system when exposed through ingestion.

When considering ingestion exposure relative to the Soil Component of the Groundwater Ingestion Exposure Route, the first potential ingestion exposure would exist at the point of human exposure to the groundwater. The first point of human exposure to the groundwater impacted by the subject soil is located at the downgradient property limits, at which point the groundwater must meet the GRO (Class I groundwater remediation objective). Therefore, to account for cumulative effects of cis-1,2-DCE and trans-1,2-DCE, their GROs were adjusted in accordance with 35 IAC 742.805 (c), and the SROs for the Soil Component of the Groundwater Ingestion Exposure Route were calculated from those adjusted values. The corrected GROs for cis-1,2-DCE and trans-1,2-DCE (at the downgradient property limit) are 0.035 mg/L and 0.05 mg/L, respectively.

Corrections to the direct soil ingestion remediation objectives for cis-1,2-DCE and trans-1,2-DCE (in accordance with 35 IAC 742.720) resulted in the reduction of their Tier 1 Industrial-Commercial objectives from 20,000 mg/kg and 41,000 mg/kg to 10,000 mg/kg and 20,500 mg/kg, respectively. These values exceeded both the RAOs and the SROs for the Soil Component of the Groundwater Ingestion Exposure Route. Therefore, they were eliminated from further consideration as the final SRO for the upper fill/till silty clay.

According to Appendix A, Table F of TACO, TCE, PCE, and VC have cumulative carcinogenic effects on the liver. According to 35 IAC 742.805 (d), the cumulative effects are satisfied for this combination of chemicals if the cumulative risk does not exceed 1 in 10,000. Using 35 IAC 742 Appendix A, Table H, one can use the 1 in 1,000,000 cancer risk concentrations for PCE and VC to determine that the actual cancer risks associated with their Class I GRO are 3.13×10^{-6} and 4.44×10^{-5} , respectively. Adding these values to the 1×10^{-6} cancer risk associated with the Class I GRO for TCE (0.005 mg/L) results in a cumulative risk of 4.853 in 100,000 (or 1 in 20,605), below the 1 in 10,000 objective. Therefore, the Class I GROs for TCE, PCE, and VC did not require correction due to cumulative effects.

Consideration for the cumulative effects of carcinogens in soil is not required for Tier 2 evaluations. Therefore, no evaluation was conducted.

5.1.3 Tier 2 Calculation Results

Table 5.1-4 presents the GW_{obj} concentrations and SROs for the Soil Component of the Groundwater Ingestion Exposure Route resulting from the Tier 2 calculations.

5.1.4 Final SRO for the Upper Fill/Till Silty Clay

A comparison of the Tier 2 SRO for the Soil Component of the Groundwater Ingestion Exposure Route and the RAOs suggests that the more conservative of the two objectives depends on the COC and area of concern. For each subject COC and each area of concern, the final SRO for the upper fill/till silty clay will consist of the more conservative of the two objectives (Table 5.1-5).

5.2 LOWER TILL REMEDIAL OBJECTIVES

Per the Illinois EPA comment letter dated August 20, 2003, and recent discussion with Illinois EPA representatives, Lockformer has developed cleanup objectives for the lower till in Areas 1 and 2 of the Lockformer site. Because the lower till occurs at a substantial depth across Areas 1 and 2, only the soil component of the groundwater ingestion exposure pathway is considered. As a result, the cleanup objectives for the lower till evaluated here are applicable only to those portions of the lower till that are unsaturated. While Lockformer understands the need to develop cleanup objectives for the lower till at this time, it wishes to reserve the right to collect additional data, make additional evaluations, and pursue off-site deed restrictions that could alter the nature of these lower till cleanup objectives and, as a consequence, subsequently petition the Illinois EPA for approval of alternative cleanup objectives for the lower till.

5.2.1 Extent of Contamination in the Lower Till

Recent investigations on the west side of Area 2 have focused on further defining the extent of soil contamination involving the unsaturated surface of the lower till. The source areas of contamination in the unsaturated lower till surface and the soil borings that define the source areas are available for review on Figure 5.2-1. The three source areas on the lower till surface on Figure 5.2-1 are identified as: (1) the general east-to-

west source occurrence in Area 2; (2) the source area below the former TCE fill pipe; and (3) the source area associated with soil boring CSB-2017B. The dimensions of each source area are identified on Figure 5.2-1.

Superimposed on Figure 5.2-1 is the configuration of the maximum extent of the mass waste unit water table from Figure 3-4. Based on the distance of the source areas of contamination in the lower till to the water table condition in the mass waste unit or the property boundary (whichever is closer), a determination of the GWRO can be made. There are various complicating factors in applying a Tier 2 analysis to establish GWROs for the lower till. The following sections establish the current nature and support for these Tier 2 evaluations. However, it is likely that through additional data development or discussions with Illinois EPA representatives, these GWROs can be further refined. Lockformer wishes to reserve the right to present additional evaluations of the GWROs if additional data become available or discussions with Illinois EPA representatives merit it.

5.2.2 The Lower Till SRO for Area 2

Figure 5.2-1 shows the configuration of the source area on the unsaturated surface of the lower till in Area 2 at the Lockformer site. The Area 2 lower till source area directly abuts the historic maximum extent of the water table determined in the mass waste unit. Per the discussions in Section 3.3.3, the primary groundwater flow within the lower till can be expected to flow horizontally within the lower till to the water table condition with the mass waste unit. As a result, the source configuration in Area 2 is situated approximately perpendicular to the extent of the water table condition in the mass waste unit. The source area width is 97 meters, and the source area length is 21 meters.

The fact that the lower till source area in Area 2 abuts both the water table condition in the mass waste unit and the western property boundary is significant. The groundwater flow in the lower till at this western property boundary would need to meet the Maximum

Contaminant Limit (MCL) for TCE and cis-1,2-DCE if it crosses the western property boundary in the lower till (only TCE and cis-1,2-DCE have been determined to exceed Tier 1 objectives for the soil component of the groundwater ingestion pathway). Groundwater flow in the lower till that discharges to the water table condition in the mass waste unit and flows with the advective flow in the mass waste unit groundwater would soon need to meet the MCL along portions of this western property boundary. However, at distances away from the western property boundary, groundwater flow from the lower till to the mass waste unit travels a significant distance prior to encountering the property boundary. An analysis of this groundwater flow component is complicated by the groundwater mound on the Ogden Corporate Center property illustrated on Figures 3-5 through 3-8 and discussed in Section 3.3.1. As a result, Lockformer would like to discuss a methodology for evaluating this groundwater flow component and/or additional data development that the Illinois EPA finds acceptable to allow a discretization of the Area 2 lower till source area for additional SRO evaluation. This would result in a variable SRO for the lower till in Area 2 with distance away from the west property line. In lieu of this, the following SROs evaluations have been made currently:

- It is not reasonable to apply a dilution factor (DF) to these calculations because it would appear the source area extends to the structural high on the lower till and would not be subject to dilution effects from advective transport upgradient in the lower till.
- Without dilution and because a portion of the lower till source area in Area 2 borders the property boundary, the target soil leachate concentration (C_w) in equation S18 reduces to the MCL of 0.005 for TCE, and 0.070 for cis-1,2-DCE.
- Further calculation of the SRO by equation S17 using site data available for the lower till on the west side of Area 2 result in a calculated SRO lower than the Tier 1 values for TCE and cis-1,2-DCE.

As a result of this evaluation of the SRO for the lower till in Area 2, Lockformer will currently use the TACO Tier 1 soil component of the groundwater ingestion exposure route for TCE and cis-1,2-DCE of 0.06 mg/kg and 0.40 mg/kg, respectively.

5.2.3 The Lower Till SRO for the Former TCE Fill Pipe Area

Figure 5.2-1 shows the configuration of the source area on the unsaturated surface of the lower till at the former TCE fill pipe at the Lockformer site. The former TCE fill pipe is located 62.2 meters from the water table boundary in the mass waste unit. Per the discussions in Section 3.3.3, the primary groundwater flow within the lower till can be expected to flow horizontally within the lower till to the water table condition with the mass waste unit. As a result, the source configuration at the former TCE fill pipe is situated approximately perpendicular to the extent of the water table condition in the mass waste unit. The source area width 36 meters, and the source area length is 36 meters.

To establish the SRO for the lower till at the former TCE fill pipe, equation R26 from TACO was first used to back-calculate a groundwater source concentration (C_{source}) at the former TCE fill pipe area from the water table occurrence in the mass waste unit. To do this, the following parameterization was used:

$C_{(x)}$	= 0.005 mg/L (MCL for TCE)
X	= 6,220 cm (Figure 5.2-1)
α_x	= 622 cm (R16)
λ	= 0.00042 d ⁻¹ (TACO Appendix C Table E)
U	= 0.26 cm/d (Section 3.3.3)
S_w	= 3,600 cm (Figure 5.2-1)
α_y	= 207 cm (R17)
S_d	= 366 cm (thickness of lower till impacted above Tier I in CSB-1202 cross-section B-B' <i>Supplemental Comprehensive VOC Investigation Report</i> , October 18, 2002)
α_z	= 31.1 cm (R18)

The calculated C_{source} from the R26 equation is 7.54 mg/L. Like the evaluation for the lower till in Area 2, a dilution factor was deemed inappropriate to apply to the determination of the target soil leachate concentration (C_w) in equation S18. As a result, C_w is equivalent to the C_{source} of 7.54 mg/L.

The SRO was then calculated using the 7.54 mg/L C_w and equation S17 using the following parameterization:

P _b	= 1.8 kg/L (Table 2-2)
∅ _w	= 0.34 (Table 2-2)
∅ _a	= 0.022 (Table 2-2)
f _{oc}	= 0.0074 (Table 2-2)
H'	= 0.422 (TACO Appendix C Table E)
K _{oc}	= 166 L/kg (TACO Appendix C Table E)

The resulting SRO calculated for the lower till at the former TCE fill pipe area is 10.74 mg/kg. Soil sampling results for the lower till indicate all other COCs at the former TCE fill pipe are below TACO Tier 1 objectives.

5.2.4 The Lower Till SRO for the Area Southeast of CSB-2017B

Figure 5.2-1 shows the configuration of the source area on the unsaturated surface of the lower till for the area southeast of CSB-2017B at the Lockformer site. The lower till source southeast of CSB-2017B is oriented perpendicular to the historic maximum extent of the water table determined in the mass waste unit. Per the discussions in Section 3.3.3, the primary groundwater flow within the lower till can be expected to flow horizontally within the lower till to the water table condition with the mass waste unit. As a result, the source area southeast of CSB-2017B is situated approximately 13 meters from the maximum extent of the water table condition in the mass waste unit. However, the source area is also only 9.8 meters from the property boundary. The source area southeast of CSB-2017B has a width 42 meters, and the source area length is 15 meters.

The fact that the lower till source area southeast of CSB-2017B is so close to the property boundary is significant. The groundwater flow in the lower till at the property boundary would need to meet the MCL for TCE. To establish the SRO for the lower till in this area, equation R26 from TACO was first used to back-calculate a groundwater source

concentration (C_{source}) at the downgradient edge of the source area southeast of CSB-2017B from the property boundary. To do this, the following parameterization was used:

$C_{(x)}$	= 0.005 mg/L (MCL for TCE)
X	= 980 cm (Figure 5.2-1)
α_x	= 98 cm (R16)
λ	= 0.00042 d ⁻¹ (TACO Appendix C Table E)
U	= 0.26 cm/d (Section 3.3.3)
S_w	= 4,200 cm (Figure 5.2-1)
α_y	= 32.6 cm (R17)
S_d	= 366 cm (consistent with thickness used at the former TCE fill pipe)
α_z	= 4.9 cm (R18)

The calculated C_{source} from the R26 equation is 0.020 mg/L. Like the evaluations for the lower till in Area 2 and at the former TCE fill pipe, a dilution factor was deemed inappropriate to apply to the determination of the target soil leachate concentration (C_w) in equation S18. As a result, C_w is equivalent to the C_{source} of 0.020 mg/L.

The SRO was then calculated using the 0.020 mg/L C_w and equation S17 using the following parameterization:

P_b	= 1.8 kg/L (Table 2-2)
\emptyset_w	= 0.34 (Table 2-2)
\emptyset_a	= 0.022 (Table 2-2)
f_{oc}	= 0.0074 (Table 2-2)
H'	= 0.422 (TACO Appendix C Table E)
K_{oc}	= 166 L/kg (TACO Appendix C Table E)

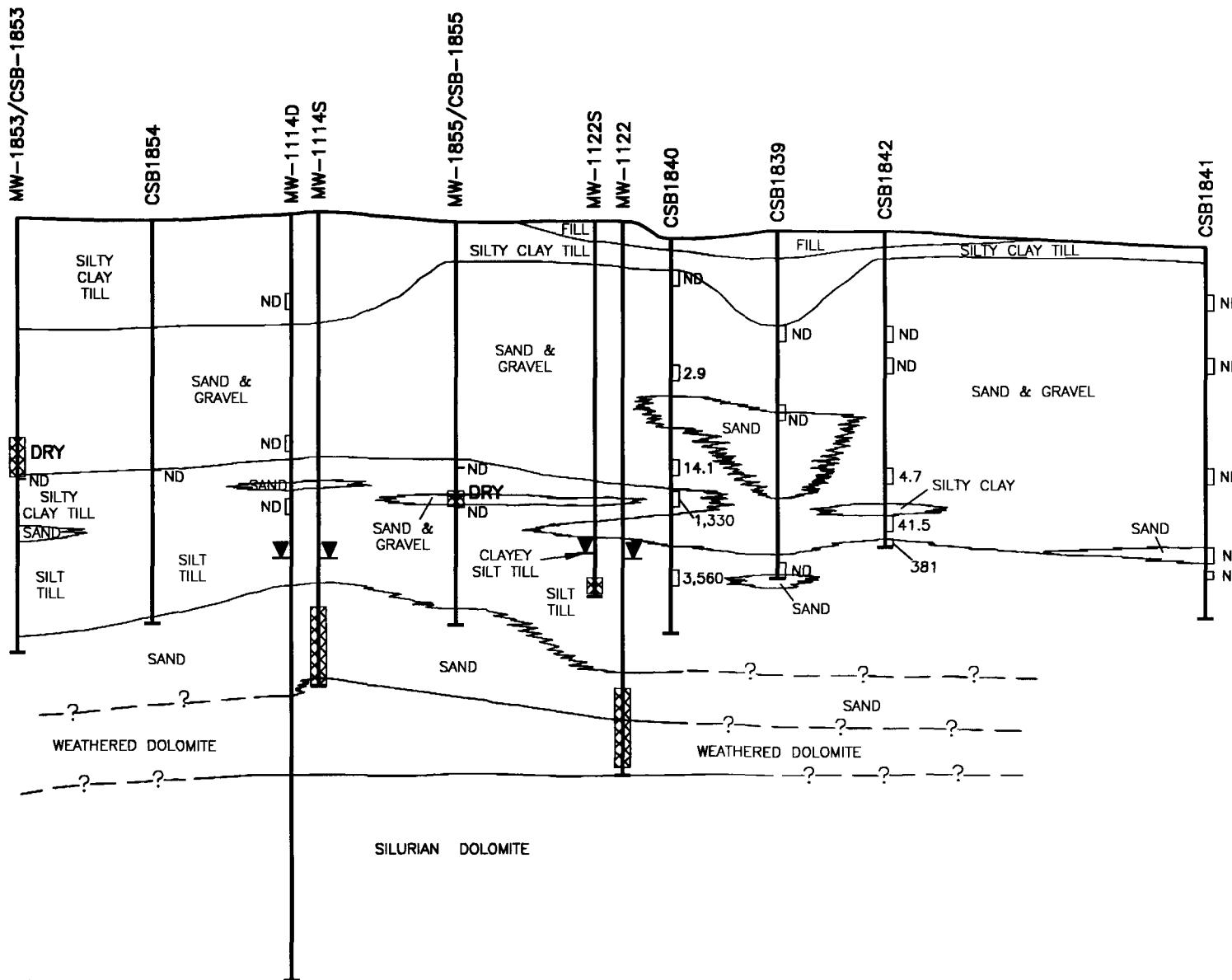
The resulting Tier 2 SRO calculated for the lower till for the source area southeast of soil boring CSB-2017B is 0.028 mg/kg. As a result of this Tier 2 evaluation of the SRO for the lower till source area southeast of CSB-2017B, Lockformer will currently use the TACO Tier 1 soil component of the groundwater ingestion exposure route for TCE of 0.06 mg/kg. Soil sampling results for the lower till indicate all other COCs southeast of CSB-2017B are below Tier 1 objectives.

FIGURES

Name of Report
The Lockformer Company / Lisle, IL
Master_March_5_Report / 3/4/2004 / RBSJ/BRS

NORTH
F

720
700
680
660
640
620
600
580



SOUTH
F'

720
700
680
660
640

- LEGEND
- ▼ WATER LEVEL MEASURED ON FEBRUARY 5, 2004
 - ▨ SCREEN INTERVAL
 - 1,330 TCE CONCENTRATION IN ug/kg

HORIZONTAL SCALE IN FEET
0 20 40 80
VERTICAL EXAGGERATION = 2X

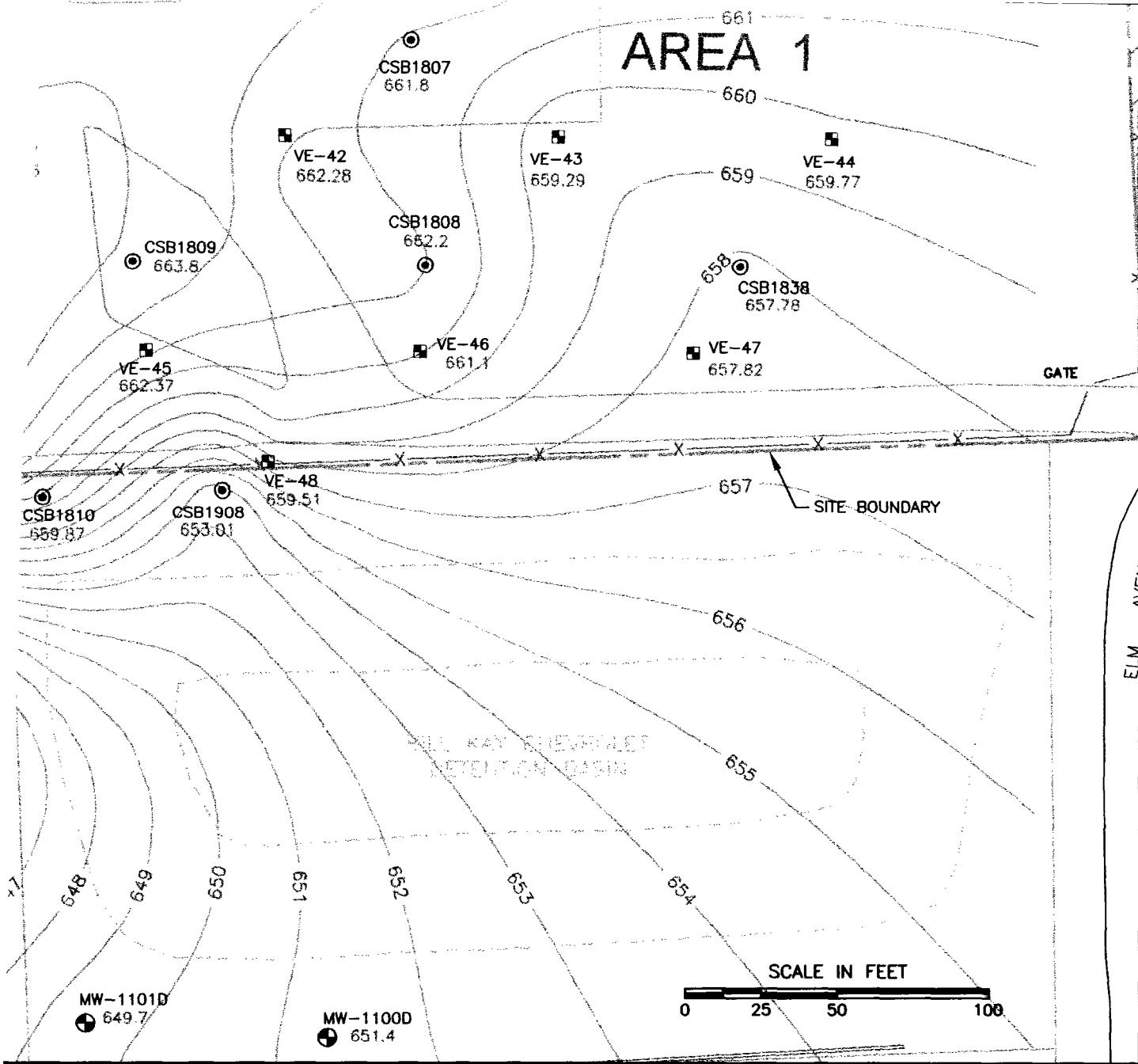
CHECK BY	
DRAWN BY BCP	
DATE	3-5-04
SCALE	AS SHOWN
CAD NO.	6526360012C
PRJ NO.	65263.01

CROSS-SECTION F - F'
THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS

Clayton
GROUP SERVICES

FIGURE

2-1



BCP
3-5-04
AS SHOWN
6526360012D
65263.60

STRUCTURAL CONTOUR FOR THE
UPPER SURFACE OF THE LOWER TILL

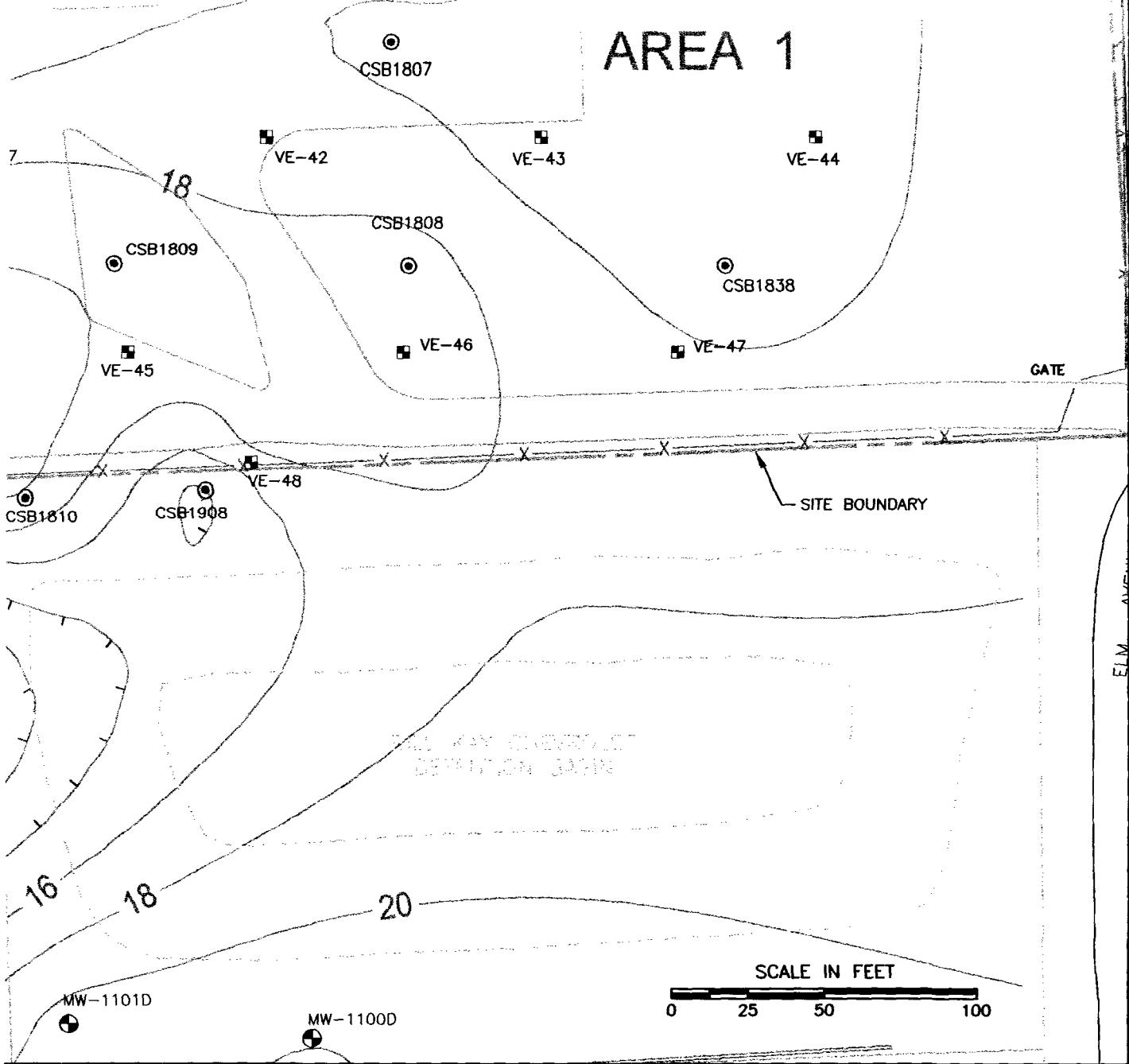
THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS



FIGURE

2-2

AREA 1



3CP
3-5-04
IS SHOWN
5526360012i
55263.60

ISOPACH MAP OF THE
LOWER TILL UNIT

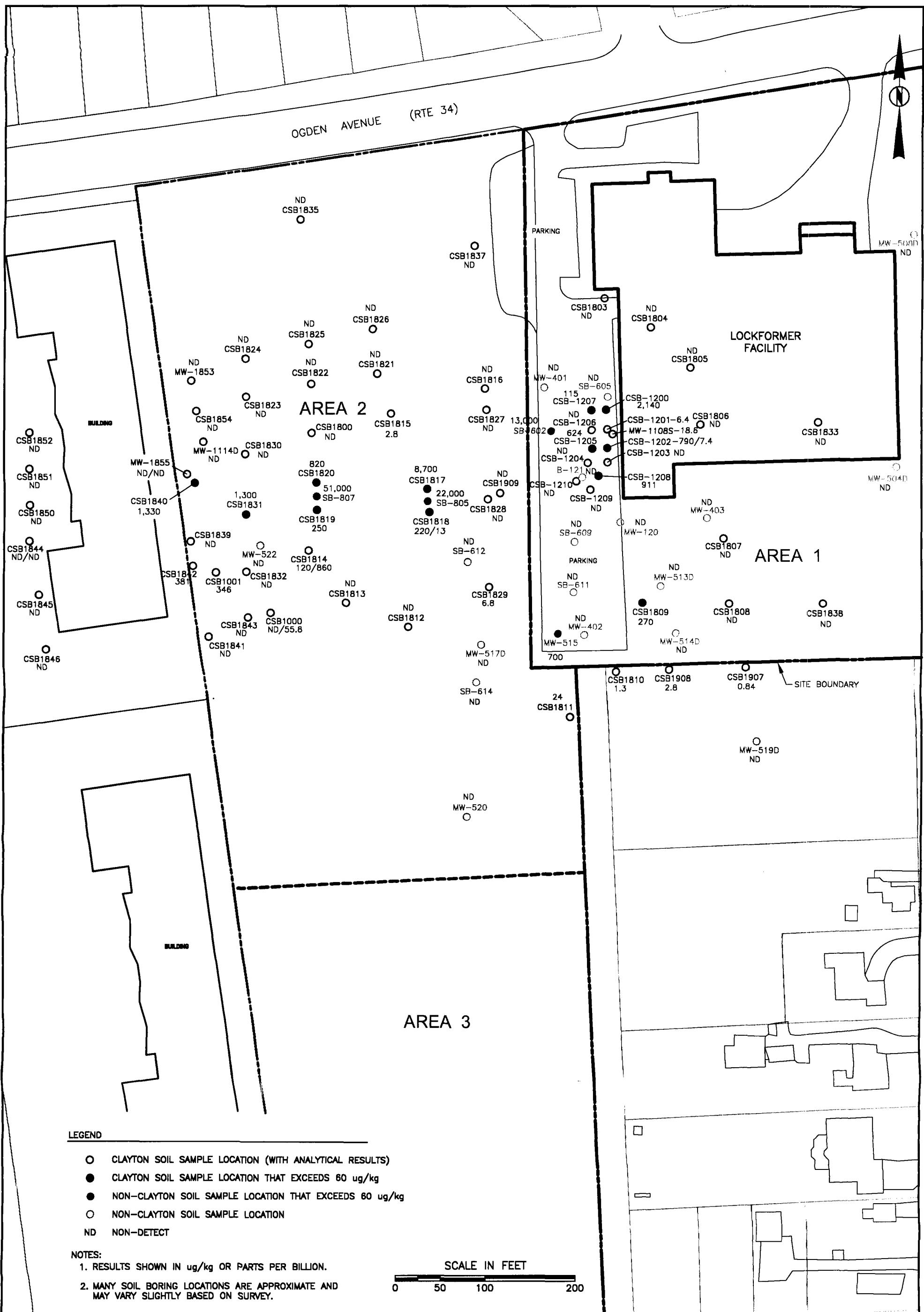
THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS



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GROUP SERVICES

FIGURE

2-3



CHECK BY	
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DATE	3-5-04
SCALE	AS SHOWN
CAD NO.	6526360012H
PRJ NO.	65263.60

TCE SOIL ANALYTICAL RESULTS
FOR THE UPPER SURFACE OF THE LOWER TILL UNIT
IN AREAS 1 AND 2
THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS



FIGURE

SEMI-REGIONAL SILURIAN DOLOMITE POTENTIOMETRIC MAP - JULY 2003

Legend

	Well Location		652 Contour Elevation
	Well Identification		Groundwater Contour
			Depth of Groundwater (Mean Sea Level)

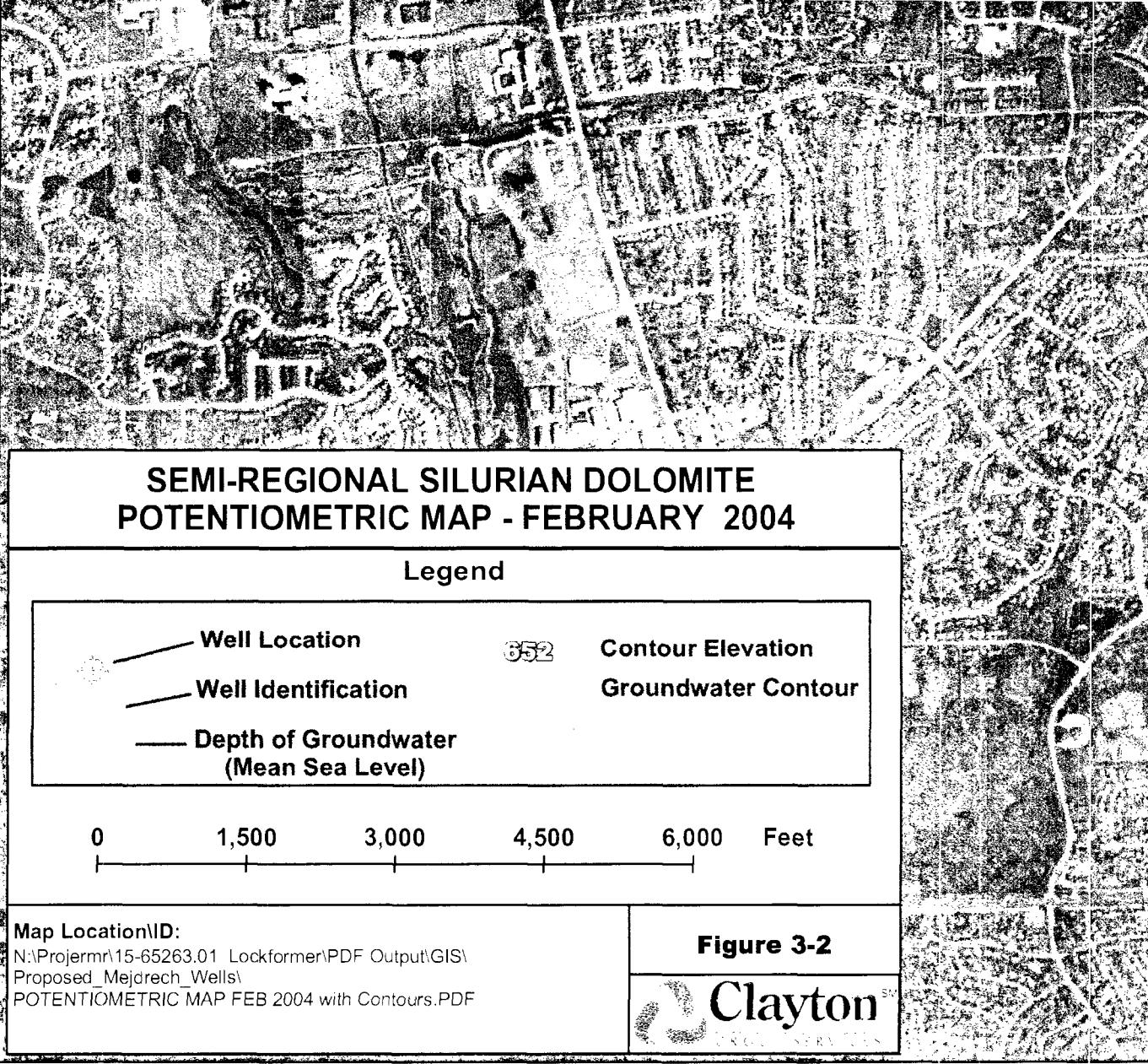
0 1,500 3,000 4,500 6,000 Feet

Map Location\ID:

N:\Projermr\15-65263.01\Lockformer\PDF Output\GIS\
Proposed_Meldrech_Wells\
POTENTIOMETRIC MAP JULY 3 2003 with Contours.PDF

Figure 3-1





SEMI-REGIONAL SILURIAN DOLOMITE POTENTIOMETRIC MAP - FEBRUARY 2004

Legend

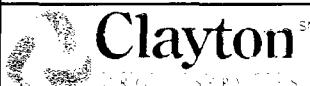
	Well Location	 352	Contour Elevation
	Well Identification		Groundwater Contour
	Depth of Groundwater (Mean Sea Level)		

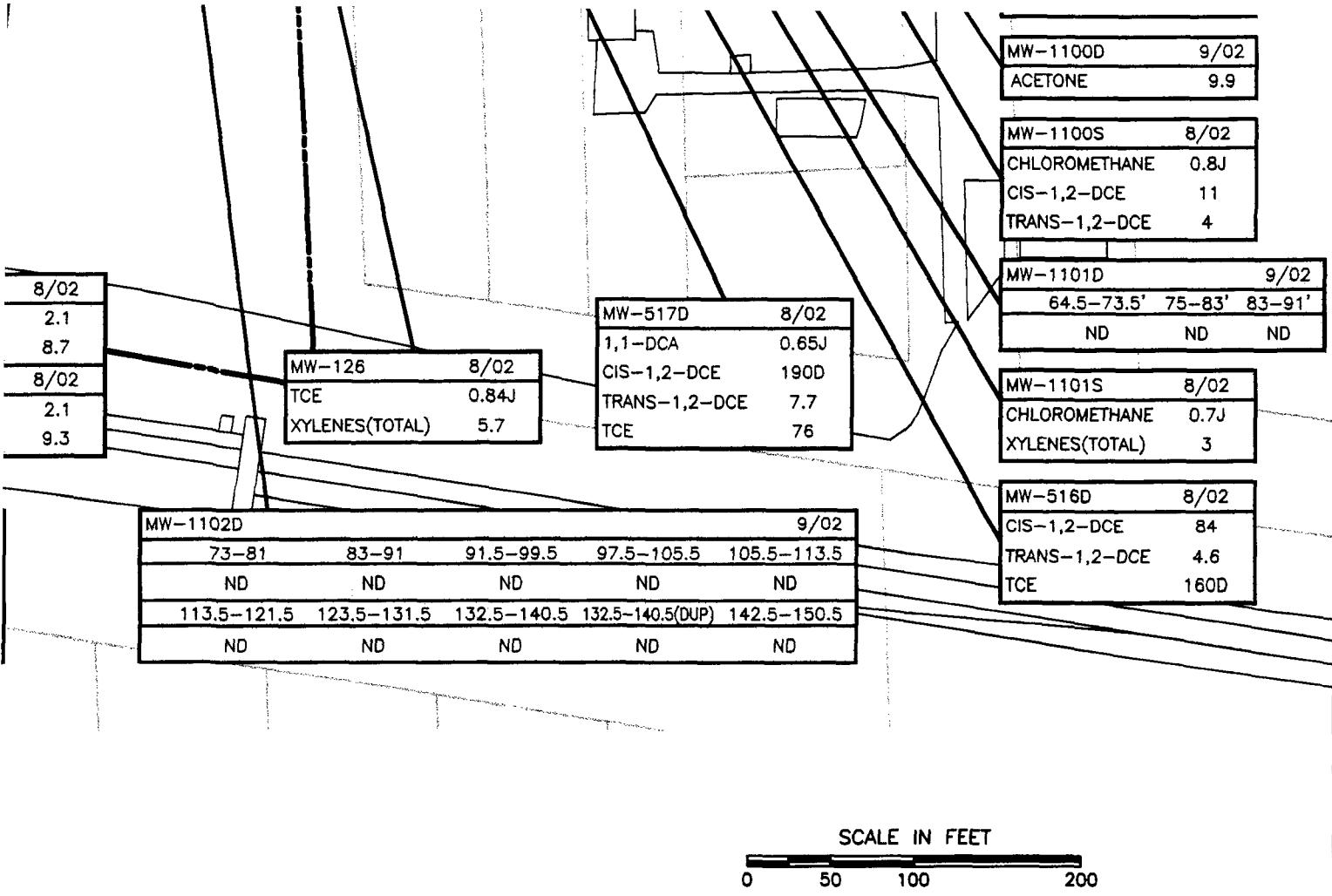
0 1,500 3,000 4,500 6,000 Feet

Map Location\ID:

N:\Projerm\15-65263.01\Lockformer\PDF Output\GIS\
Proposed_Mejdreich_Wells\
POTENTIOMETRIC MAP FEB 2004 with Contours.PDF

Figure 3-2





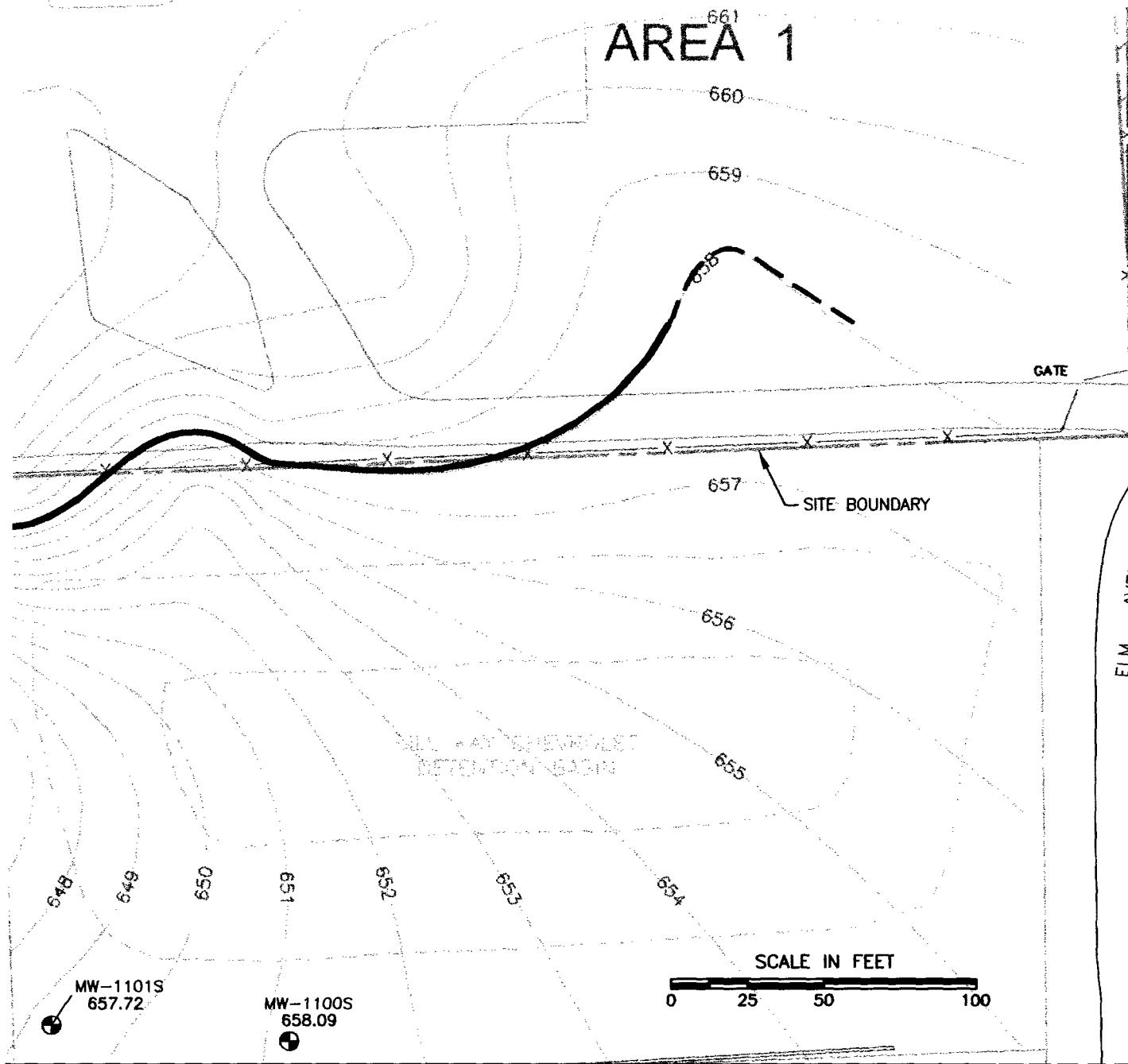
LATEST GROUNDWATER VOC RESULTS
FOR AREAS 1 AND 2

THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS

FIGURE

3-3

AREA 1



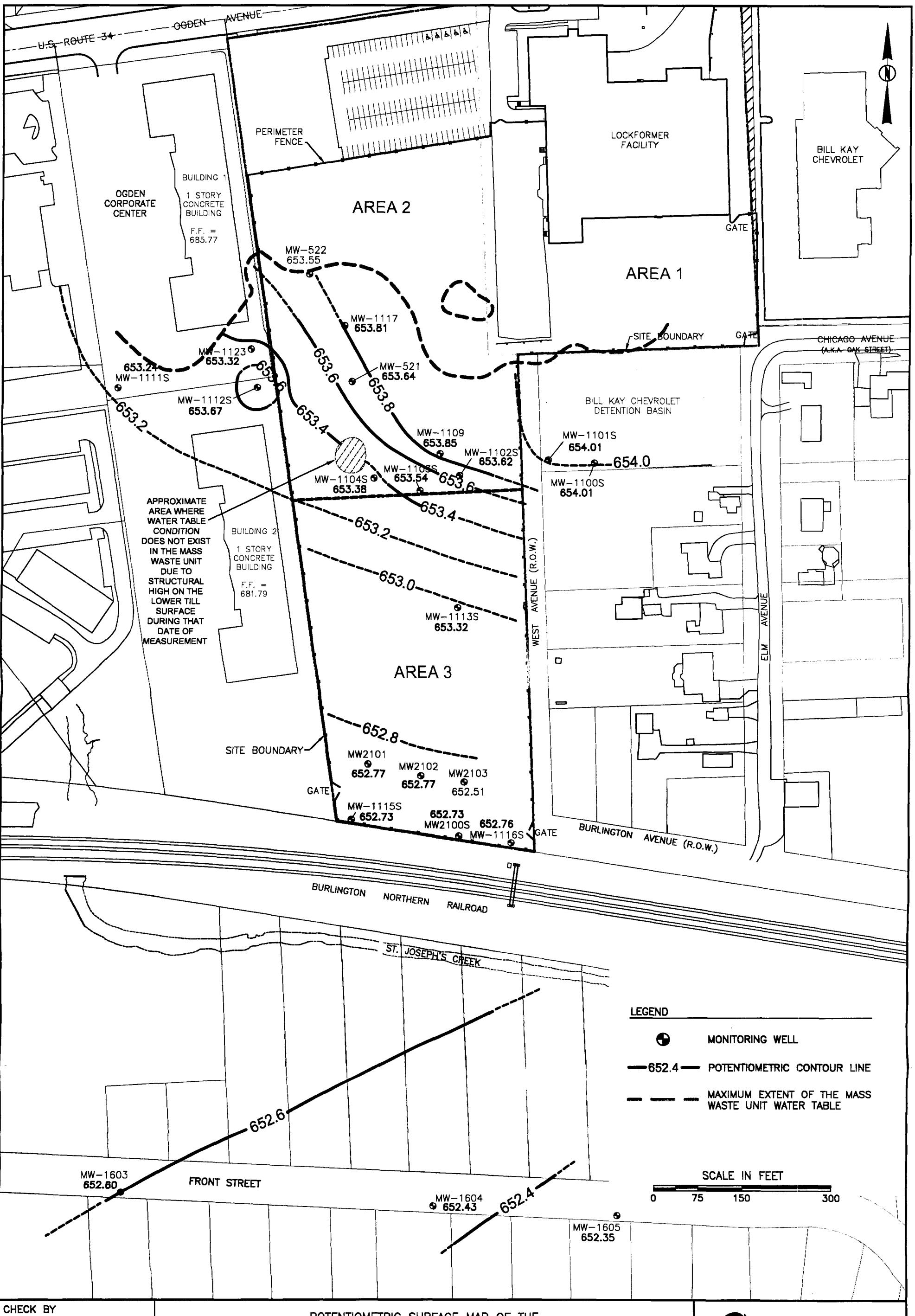
BCP
3-5-04
AS SHOWN
6526360012E
65263.60

MAXIMUM EXTENT OF THE
MASS WASTE UNIT WATER TABLE
MEASURED TO DATE AT THE LOCKFORMER SITE
THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS



FIGURE

3-4



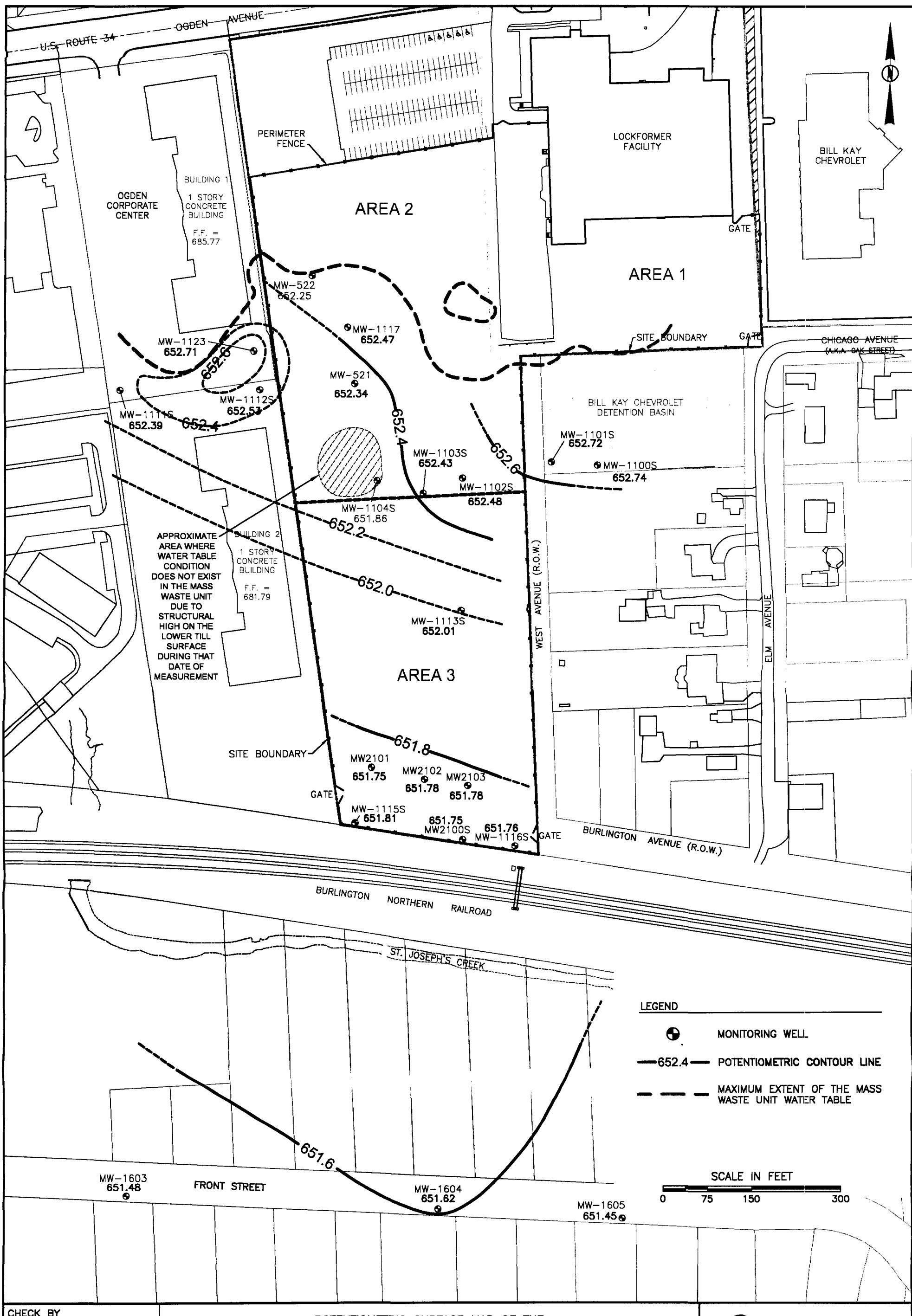
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DRAWN BY BCP	
DATE	3-5-04
SCALE	AS SHOWN
CAD NO.	6526360012a1
PRJ NO.	65263.60

POTENTIOMETRIC SURFACE MAP OF THE
MASS WASTE UNIT GLACIAL SEDIMENTS
ON NOVEMBER 8, 2002
THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS



FIGURE

3-5



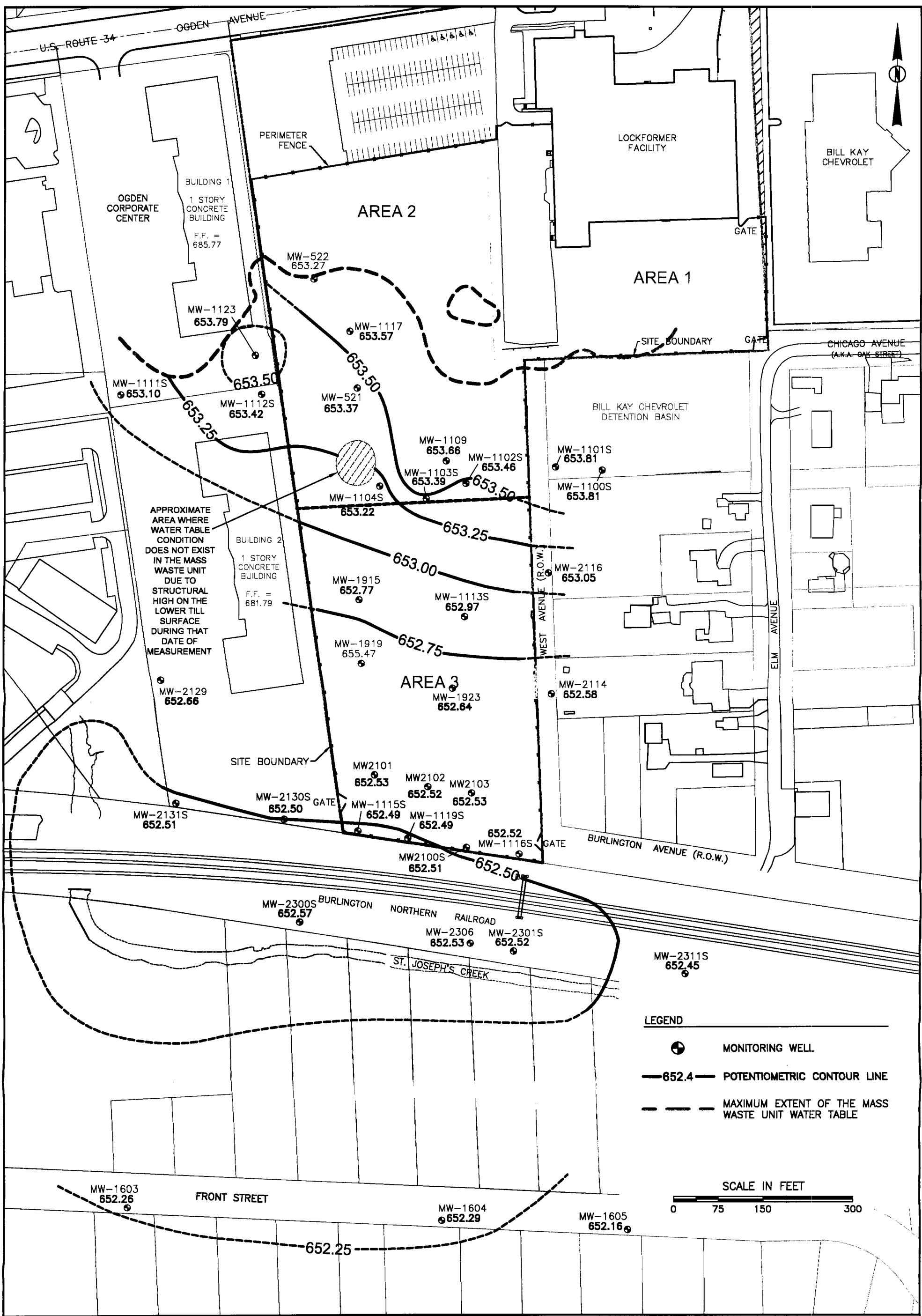
CHECK BY	
DRAWN BY BCP	
DATE 3-5-04	
SCALE AS SHOWN	
CAD NO. 6526360012a2	
PRJ NO. 65263.60	

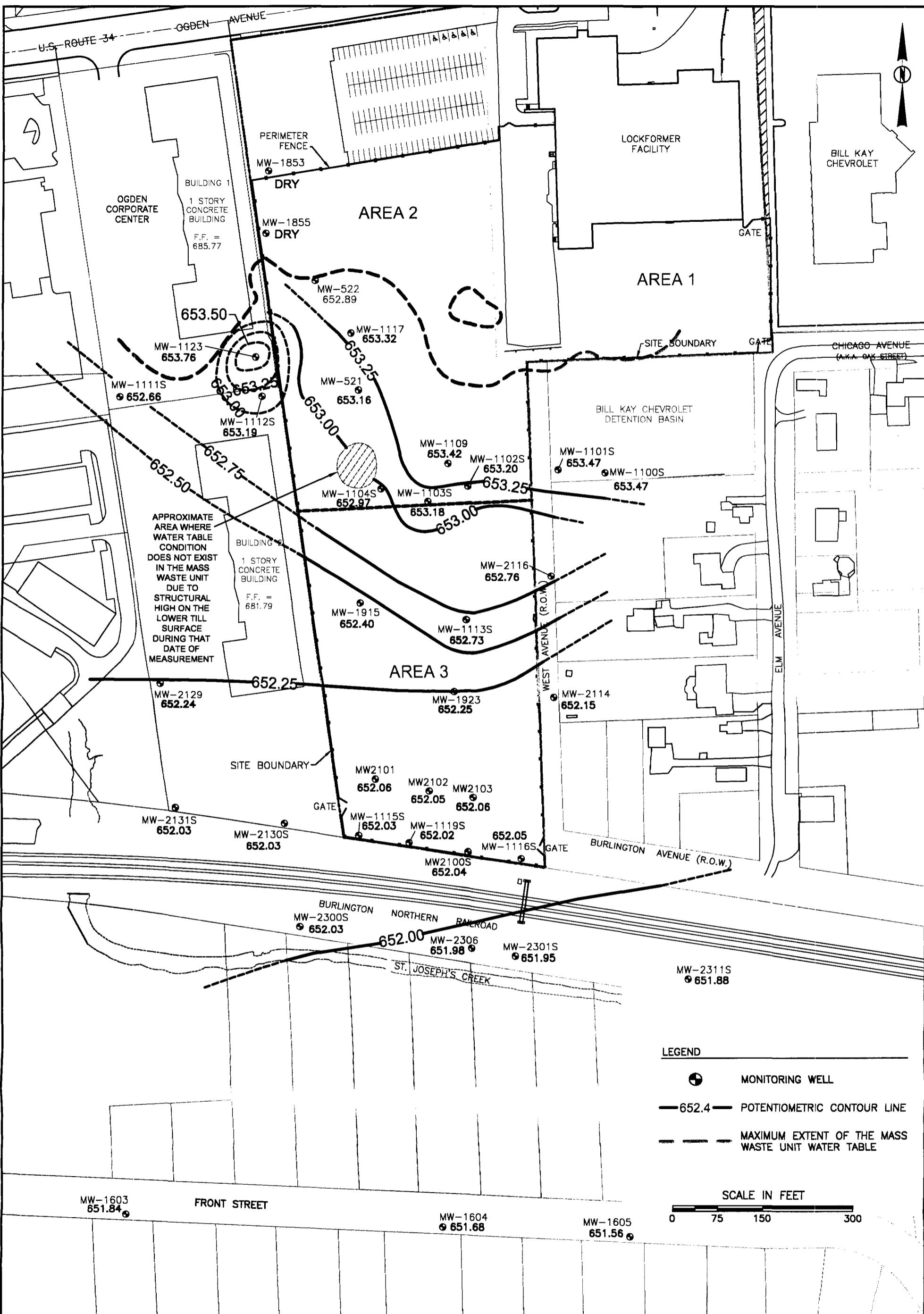
POTENSIOMETRIC SURFACE MAP OF THE
MASS WASTE UNIT GLACIAL SEDIMENTS
ON MARCH 28, 2003
THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS

 Clayton®
GROUP SERVICES

FIGURE

3-6

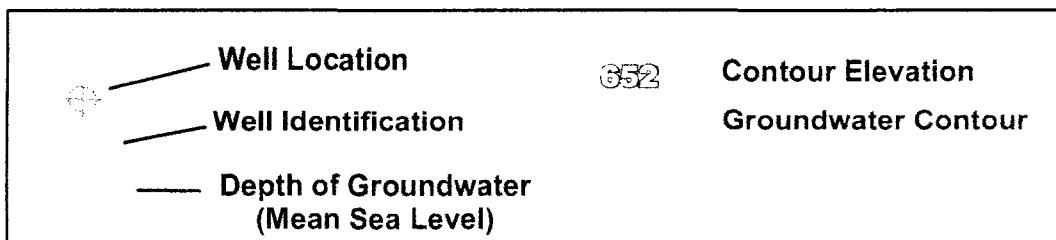




ONSITE SILURIAN DOLOMITE POTENTIOMETRIC MAP

JULY 7, 2003

Legend



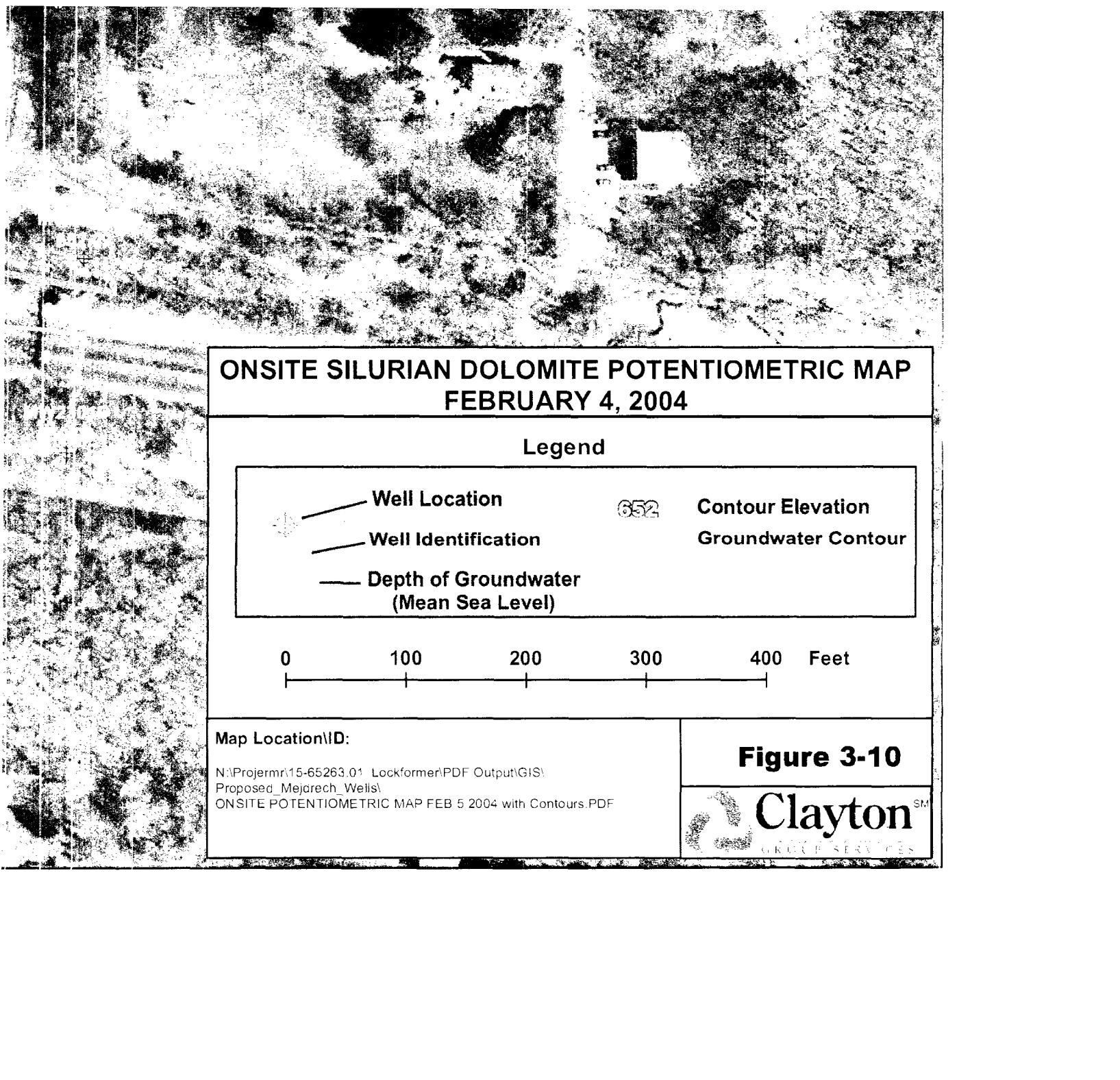
0 50 100 200 300 400 Feet

Map Location\ID:

N:\Projerm\r15-65263.01_Lockformer\PDF Output\GIS\
Proposed_Mejdreich_Wells\
ONSITE POTENTIOMETRIC MAP JULY 3 2003 with Contours.PDF

Figure 3-9

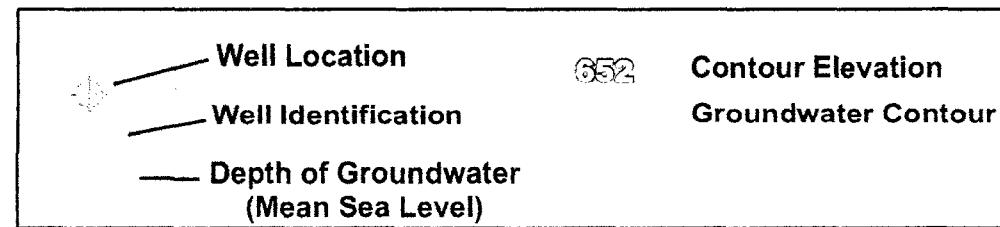
ClaytonSM
CITY SERVICES



ONSITE SILURIAN DOLOMITE POTENTIOMETRIC MAP

FEBRUARY 4, 2004

Legend



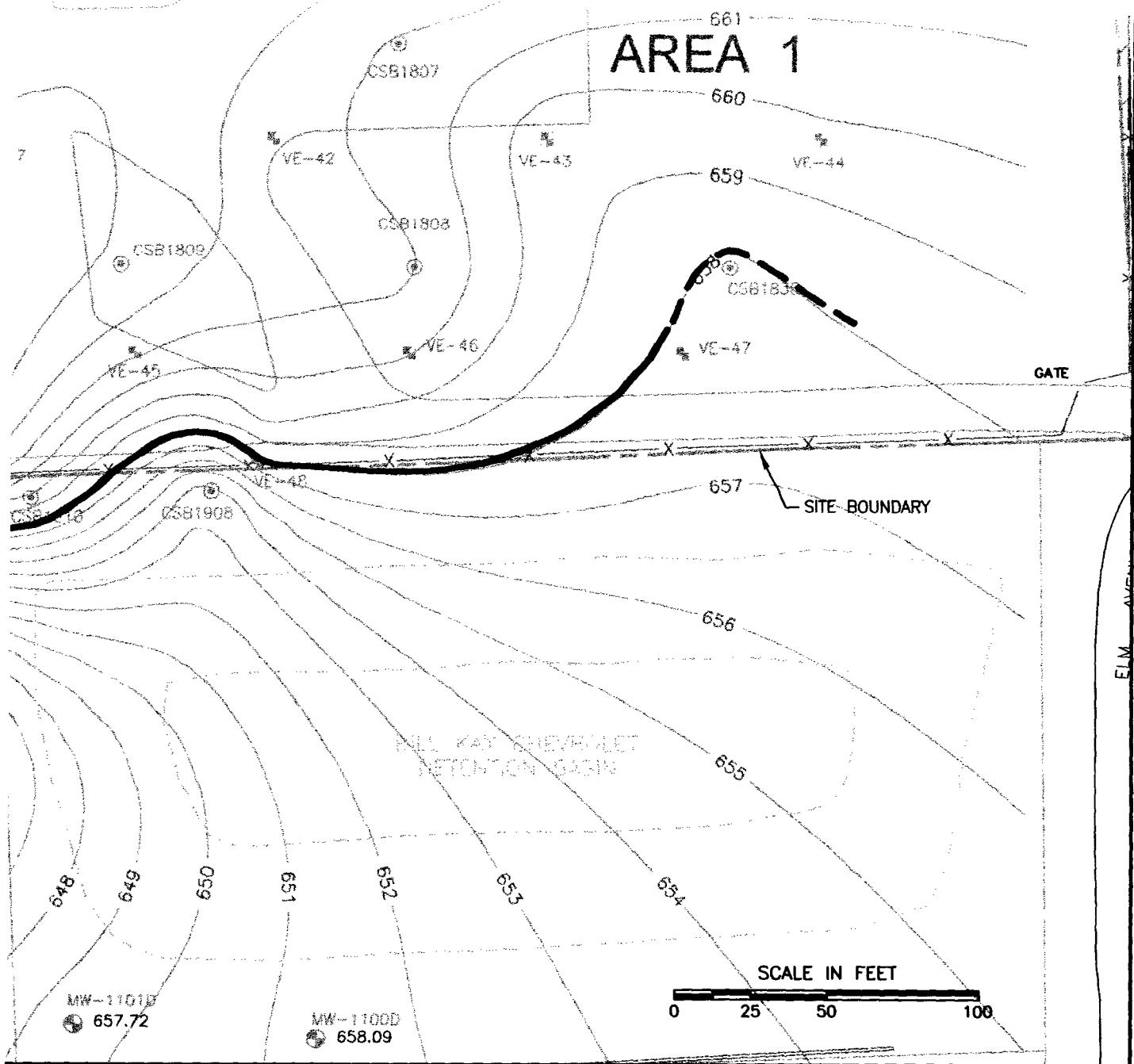
0 100 200 300 400 Feet

Map Location\ID:

N:\Projermr\15-65263.01_Lockformer\PDF Output\GIS\
Proposed_Mejarch_Wells\
ONSITE POTENTIOMETRIC MAP FEB 5 2004 with Contours.PDF

Figure 3-10





BCP
3-5-04
AS SHOWN
6526360012P
65263.60

CROSS SECTION G-G' REFERENCE AND
HYDRAULIC GRADIENT FOR LOWER TILL MAP

THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS

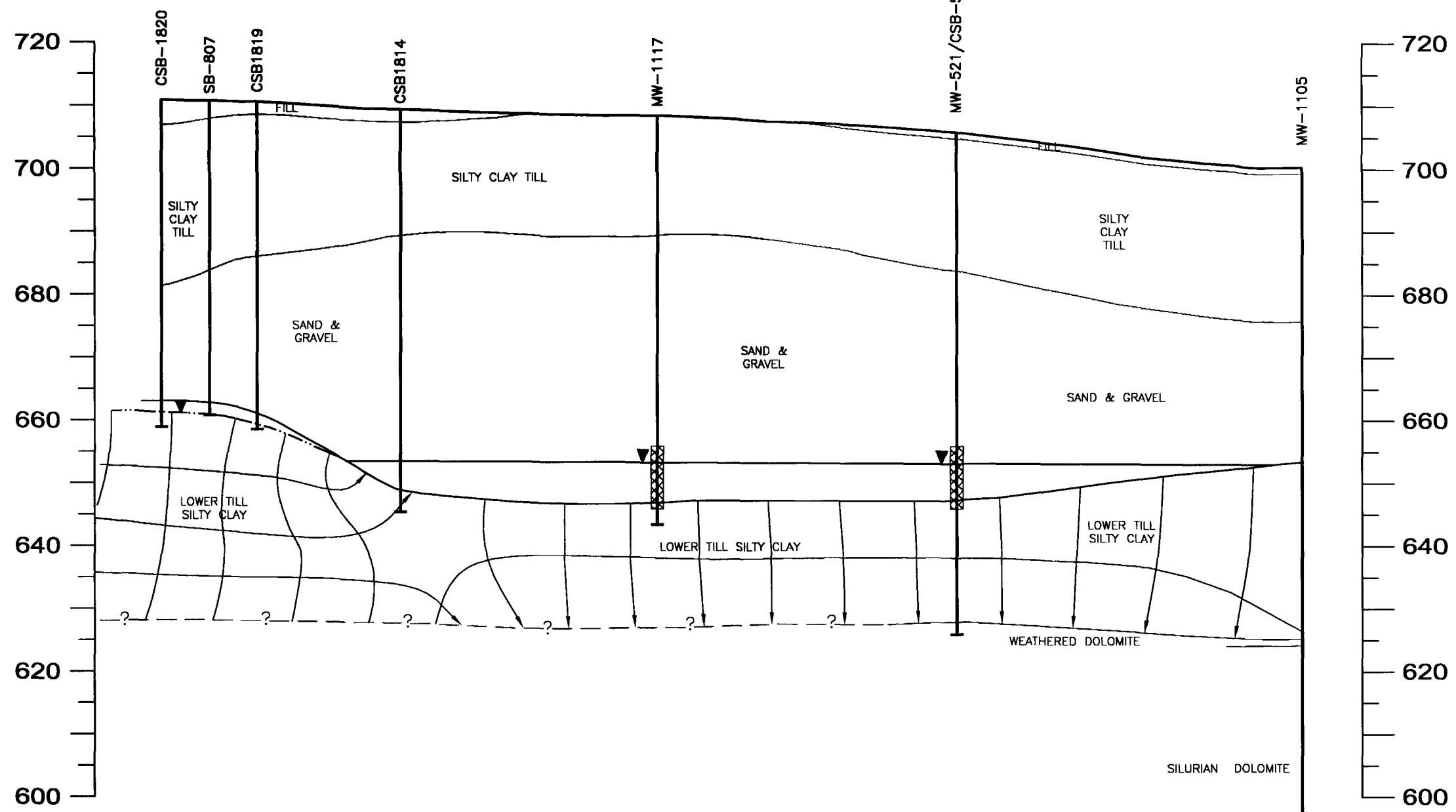


FIGURE

3-11

NORTH
G

SOUTH
G'



LEGEND

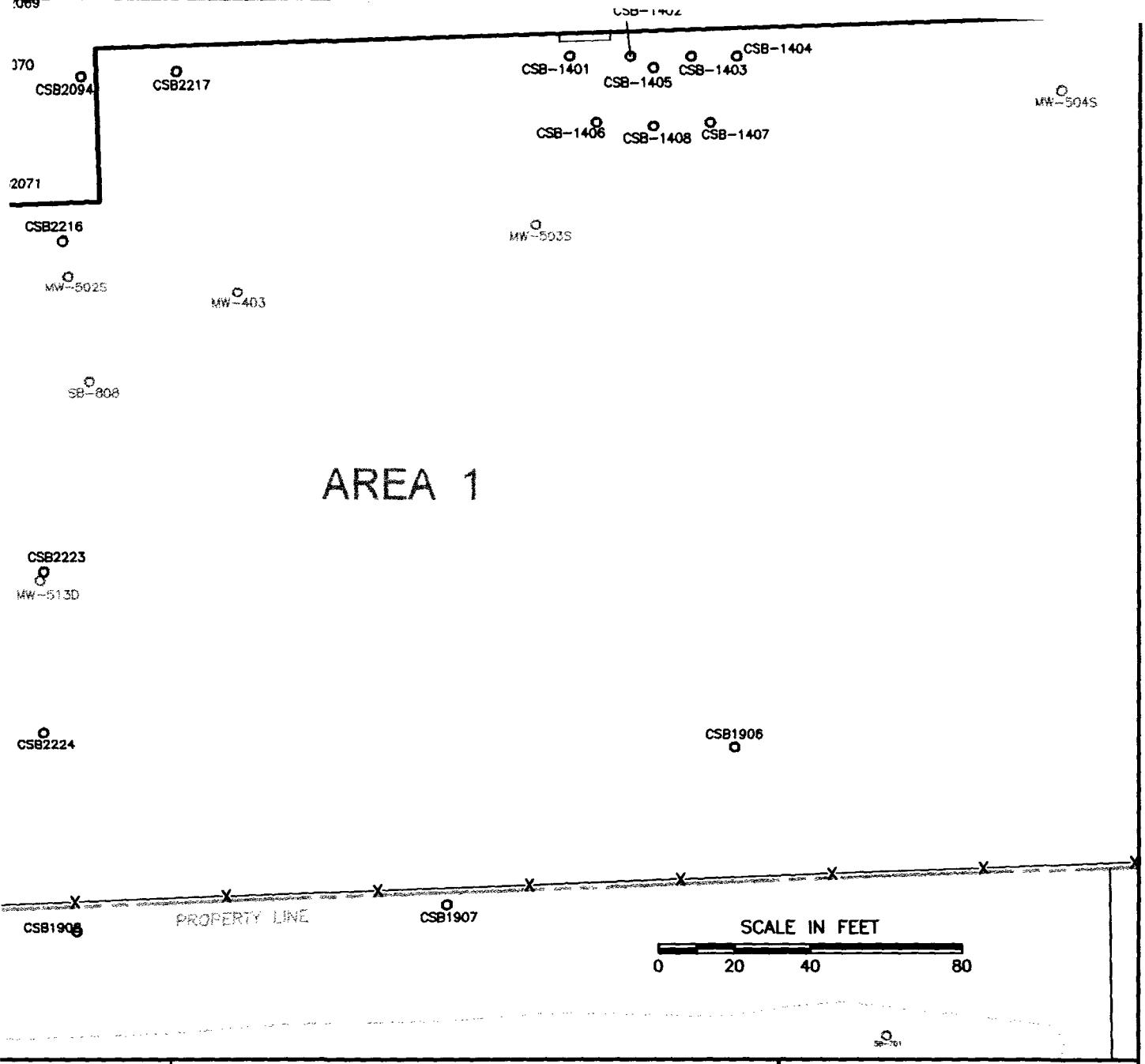
- ▼ WATER LEVEL MEASURED ON FEBRUARY 5, 2004
- ▨ SCREEN INTERVAL

HORIZONTAL SCALE IN FEET
0 20 40 60 80
VERTICAL EXAGGERATION = 2X

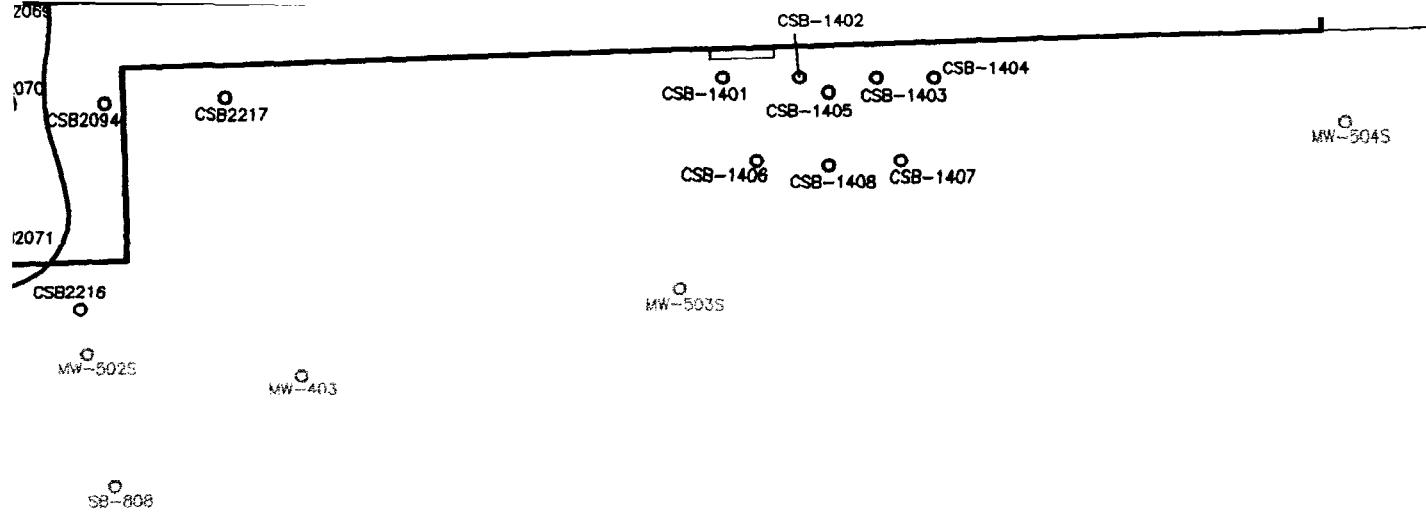
CHECK BY
DRAWN BY BCP
DATE 3-5-04
SCALE AS SHOWN
CAD NO. 6526360012P
PRJ NO. 65263.60

CONCEPTUAL FLOW NET DIAGRAM
ILLUSTRATING ANTICIPATED
GROUNDWATER FLOW IN THE LOWER TILL
THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS

Clayton®
GROUP SERVICES
FIGURE
3-12



BCP 3-5-04 AS SHOWN 6526360012F 65263.60	EXTENT OF CONTAMINATION SAMPLING LAYOUT MAP UPPER TILL/FILL IN AREAS 1 & 2 THE LOCKFORMER COMPANY 711 W. OGDEN AVENUE LISLE, ILLINOIS	 Clayton® GROUP SERVICES
		FIGURE 5.1-1

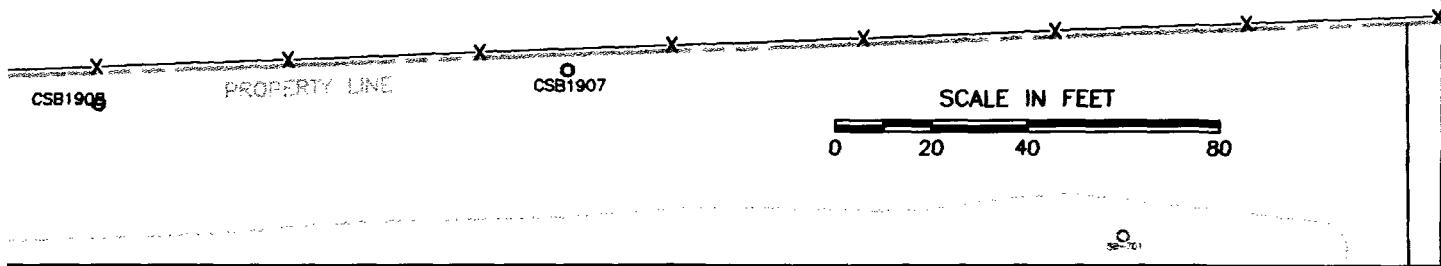


AREA 1

CSB2223
MW-513D

CSB2224

CSB1906



BCP
3-5-04
AS SHOWN
6526360012F
65263.60

CIS-1,2-DCE DELINEATION MAP
UPPER TILL/FILL IN AREAS 1 & 2

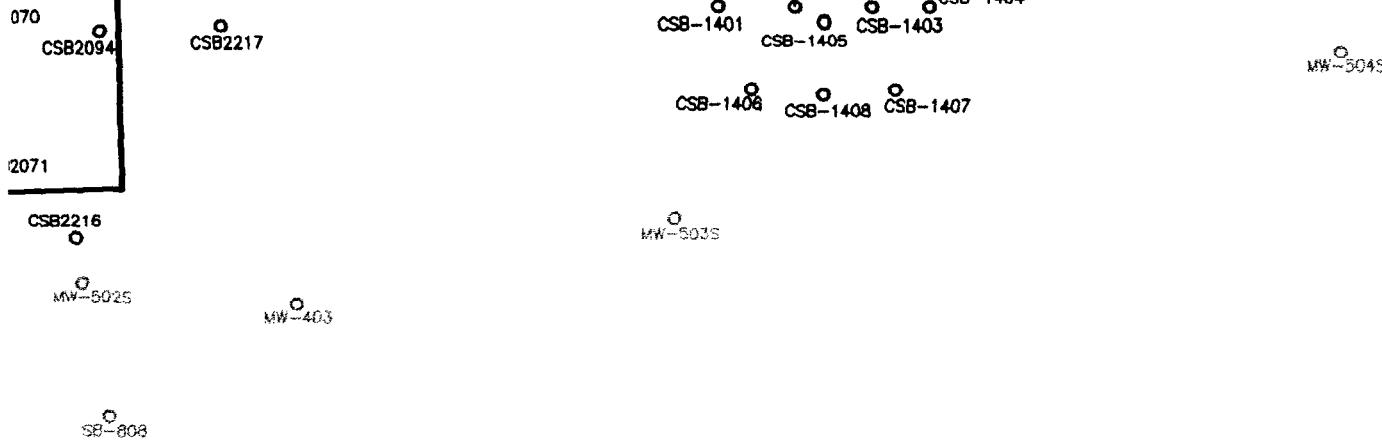
THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS



FIGURE

5.1-2

2069



AREA 1

CSB2223
MW-513D

CSB2224

CSB1906

X PROPERTY LINE X

CSB1907

SCALE IN FEET

0 20 40 80

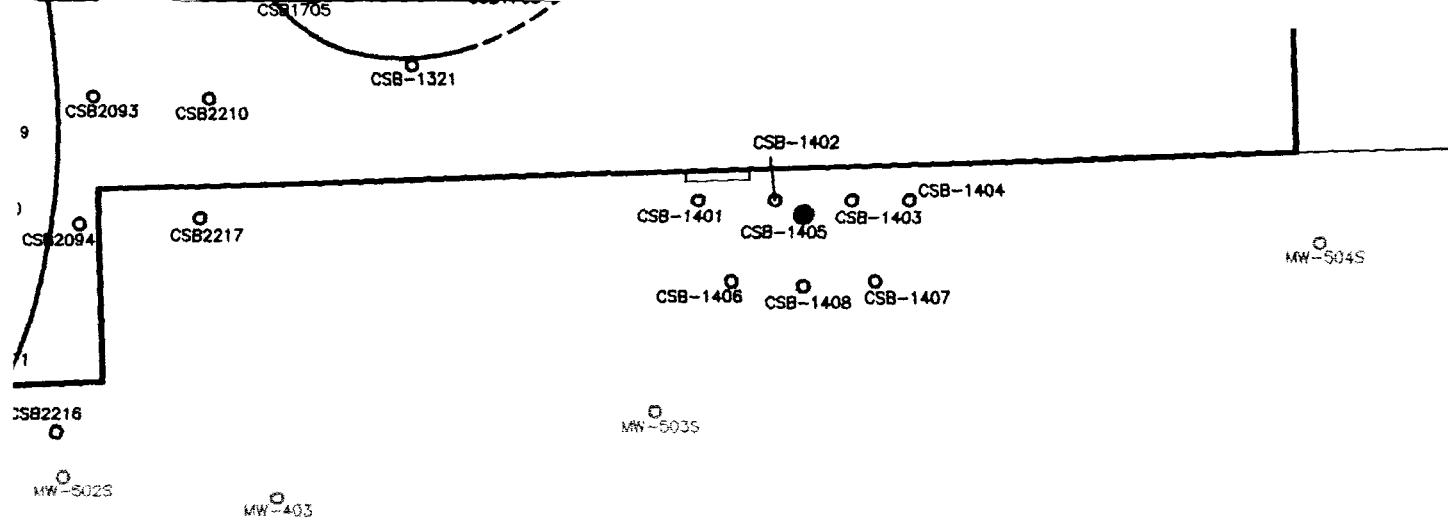
BCP
3-5-04
AS SHOWN
6526360012F
65263.60

TRANS-1,2-DCE DELINEATION MAP
UPPER TILL/FILL IN AREAS 1 & 2

THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS



FIGURE 5.1-3

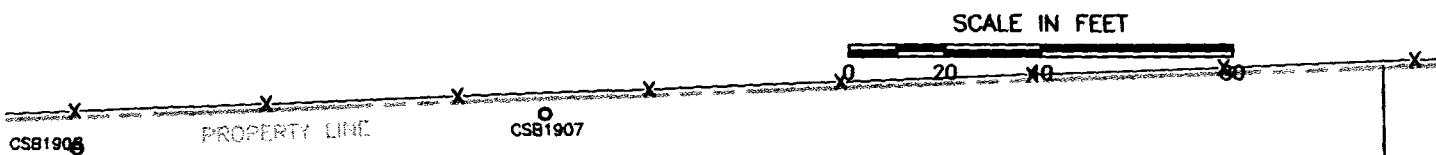


AREA 1

CSB2223
W-513D

CSB2224

CSB1906



Y
Y BCP
3-5-04
AS SHOWN
6526360012F
65263.60

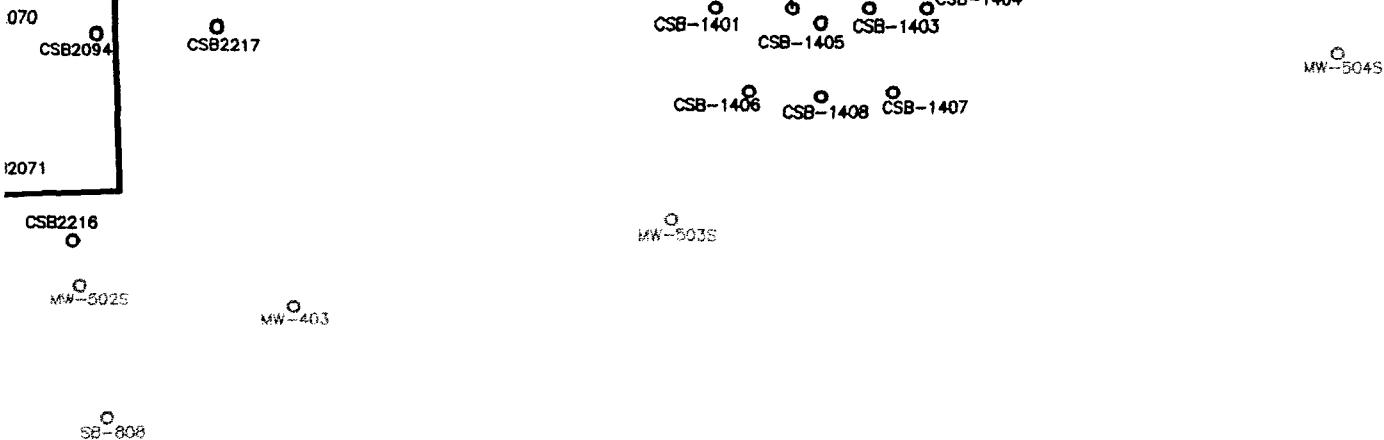
TCE DELINEATION MAP
UPPER TILL/FILL IN AREAS 1 & 2
THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS



FIGURE

5.1-4

2009



AREA 1

CSB2223
MW-513D

CSB2224

CSB1906

X PROPERTY LINE X CSB1908

X CSB1907

SCALE IN FEET

0 20 40 80

BCP
3-5-04
AS SHOWN
6526360012F
65263.60

PCE DELINEATION MAP
UPPER TILL/FILL IN AREAS 1 & 2
THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS



FIGURE

5.1-5

2069

070

CSB2094

CSB2217

CSB-1402
CSB-1401 CSB-1405 CSB-1403 CSB-1404
CSB-1406 CSB-1408 CSB-1407

MW-304S

12071

CSB2216

MW-503S

MW-502S

MW-403

SB-808

AREA 1

CSB2223

8

MW-513D

CSB2224

CSB1906

CSB1905

PROPERTY LINE

CSB1907

SCALE IN FEET

0 20 40 80

58-701

BCP
3-5-04
AS SHOWN
6526360012F
65263.60

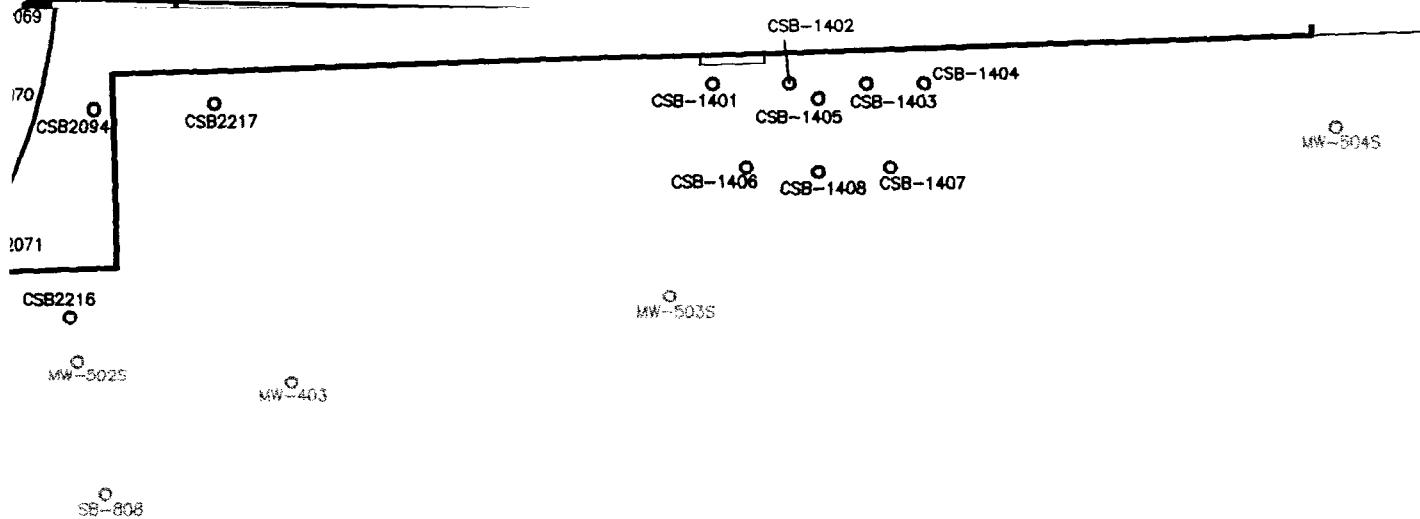
1,1,1-TCA DELINEATION MAP
UPPER TILL/FILL IN AREAS 1 & 2

THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS

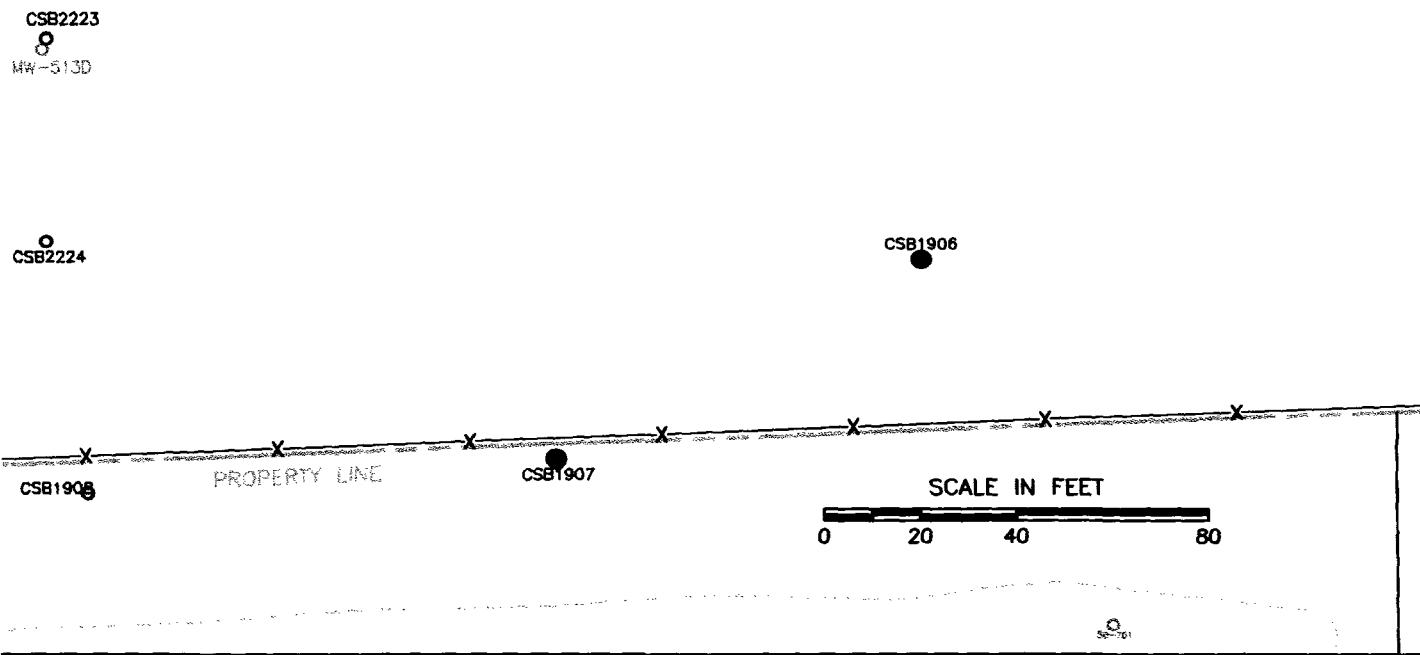


FIGURE

5.1-6



AREA 1



BCP 3-5-04 AS SHOWN 6526360012F 65263.60	VINYL CHLORIDE DELINEATION MAP UPPER TILL/FILL IN AREAS 1 & 2 THE LOCKFORMER COMPANY 711 W. OGDEN AVENUE LISLE, ILLINOIS	 Clayton® GROUP SERVICES
	FIGURE 5.1-7	

2069

070 CSB2094
CSB2217
2071 CSB2216
MW-5025
MW-403

CSB-1402
CSB-1401 CSB-1405 CSB-1403 CSB-1404
CSB-1406 CSB-1408 CSB-1407

MW-504S

MW-503S

SE-308

AREA 1

CSB2223
MW-513D

CSB2224

CSB1906

PROPERTY LINE

CSB1907

SCALE IN FEET

TOLUENE DELINEATION MAP
UPPER TILL/FILL IN AREAS 1 & 2

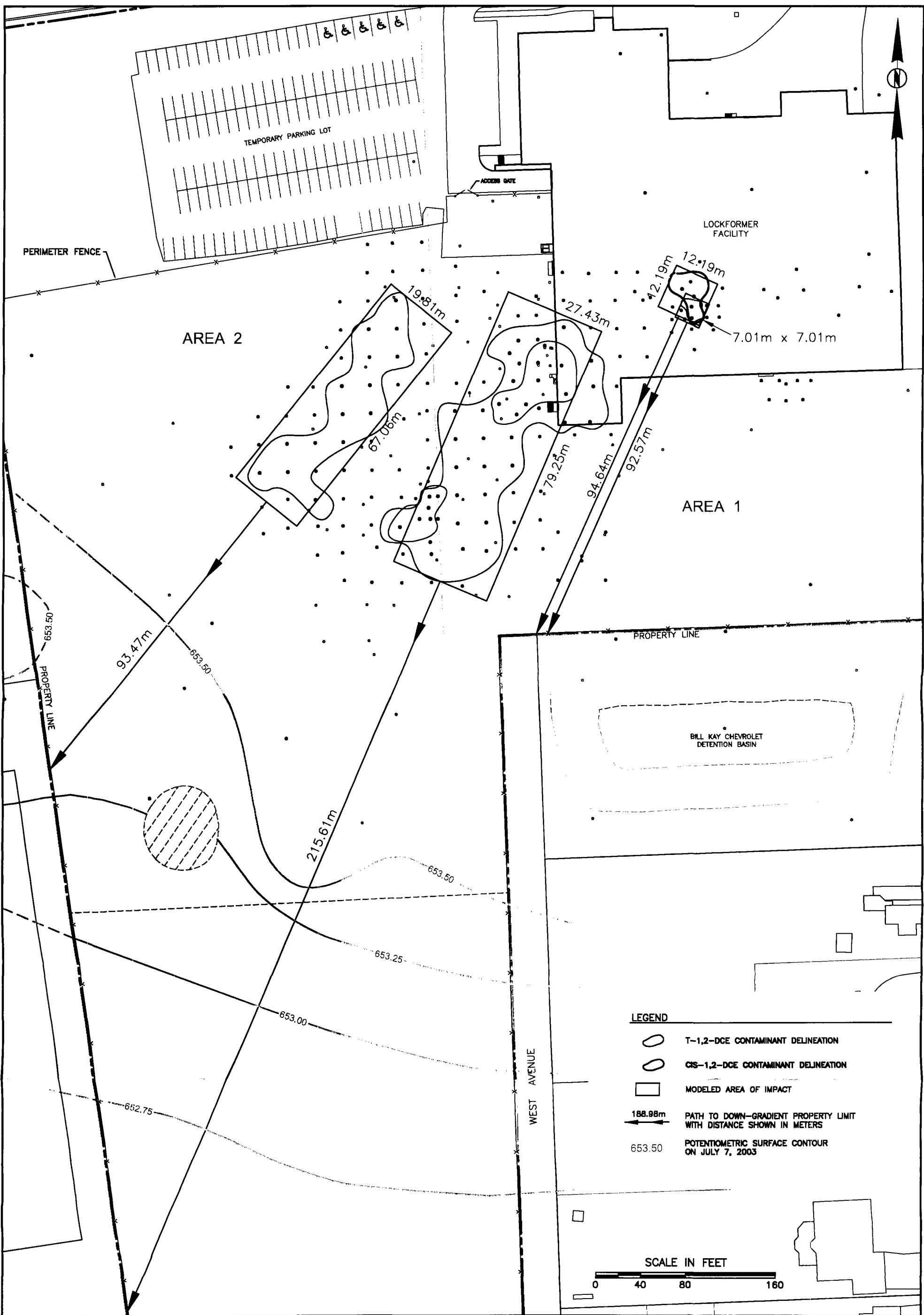
THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS

BCP
3-5-04
AS SHOWN
6526360012F
65263.60

 Clayton[®]
GROUP SERVICES

FIGURE

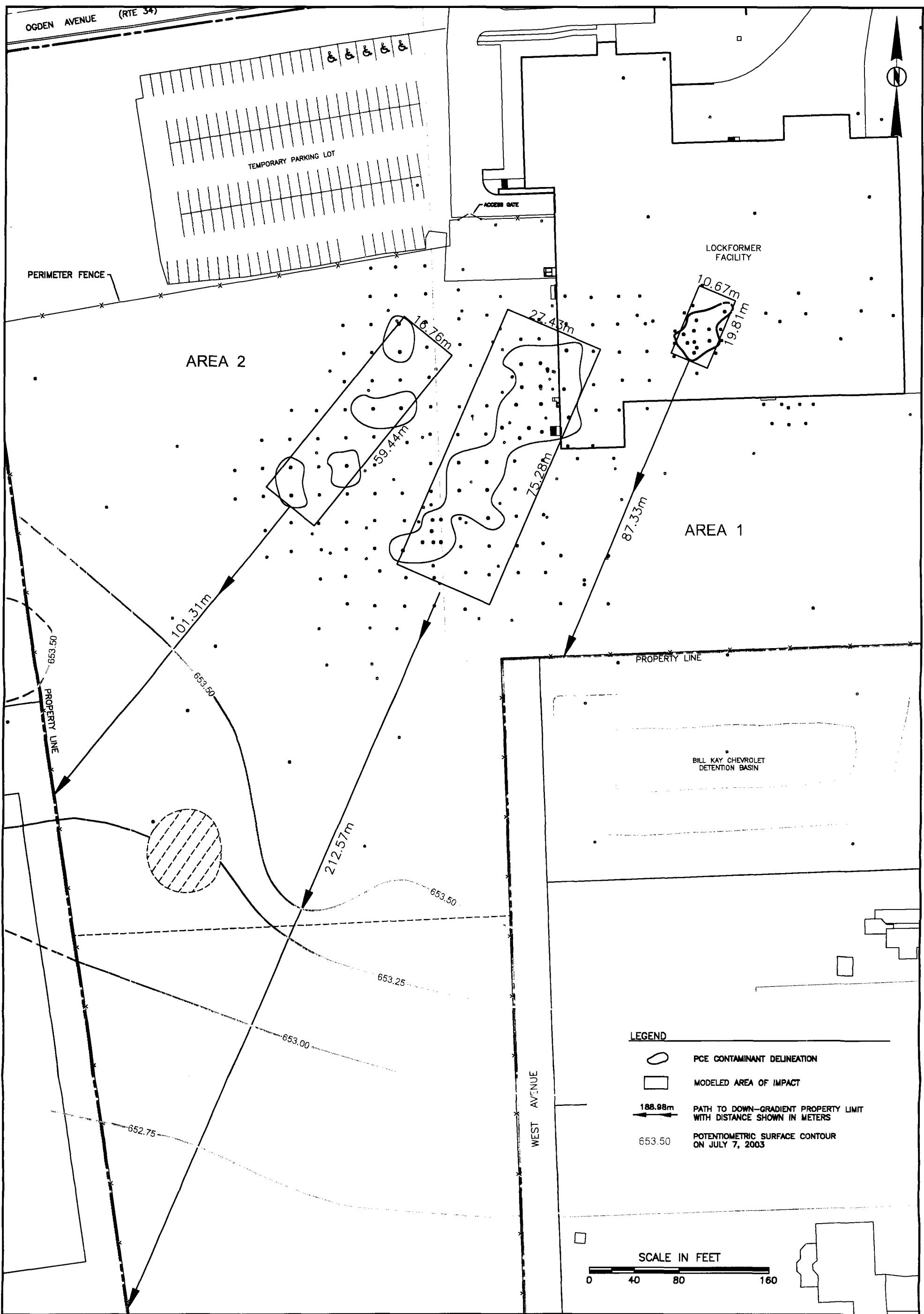
5.1-8

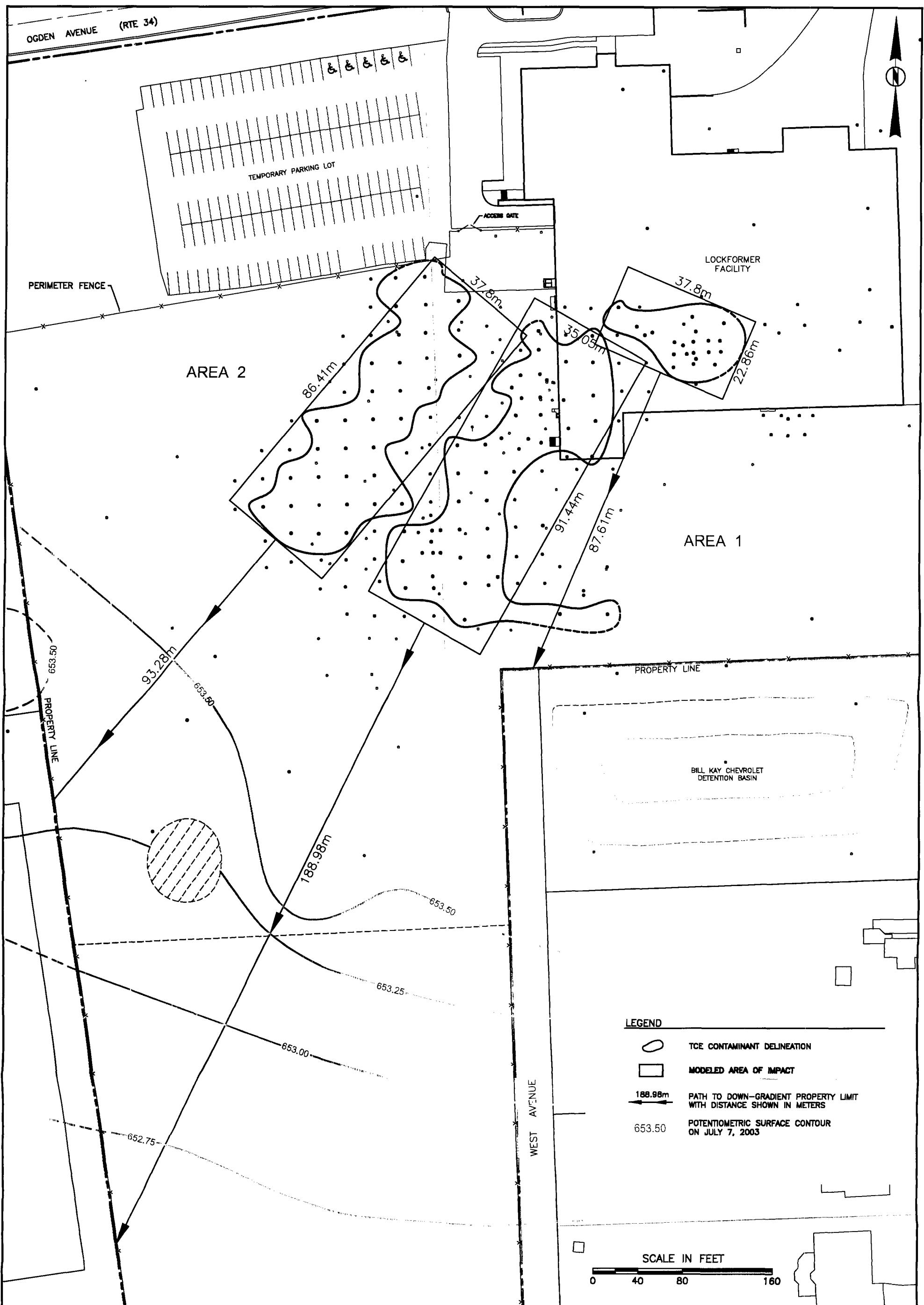


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DATE	3-5-04
SCALE	AS SHOWN
CAD NO.	6526360012J
PRJ NO.	65263.60

CONTAMINANT TRANSPORT MODEL
CIS-1,2-DICHLOROETHENE (CIS-1,2-DCE) & TRANS-1,2-DICHLOROETHENE(T-1,2,-DCE)
AREAS 1 & 2
THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS

 Clayton®
GROUP SERVICES
FIGURE 5.1-9





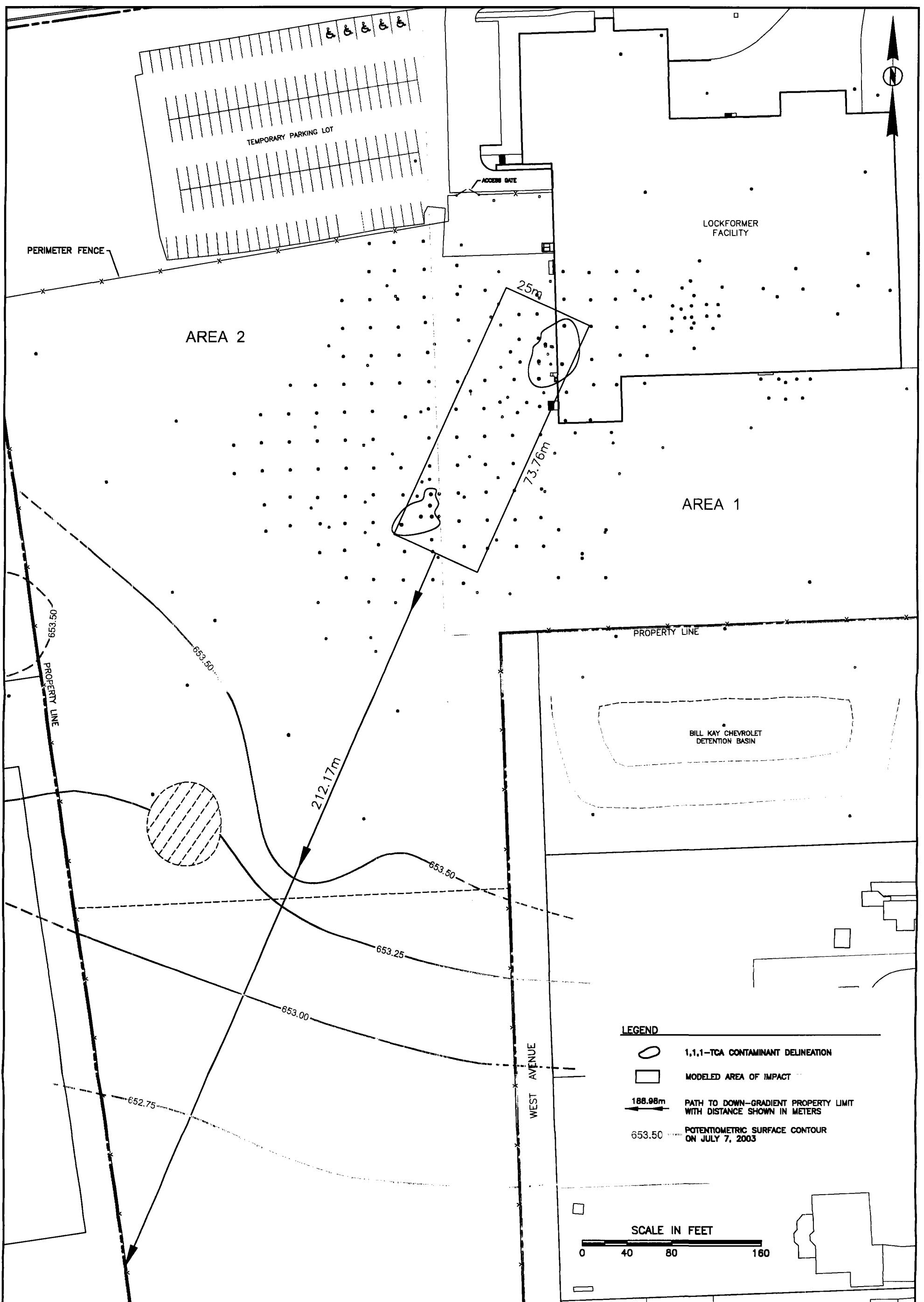
CHECK BY	
DRAWN BY BCP	
DATE	3-5-04
SCALE	AS SHOWN
CAD NO.	6526360012J
PRJ NO.	65263.60

CONTAMINANT TRANSPORT MODEL
TRICHLOROETHANE (TCE)
AREAS 1 & 2
THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS



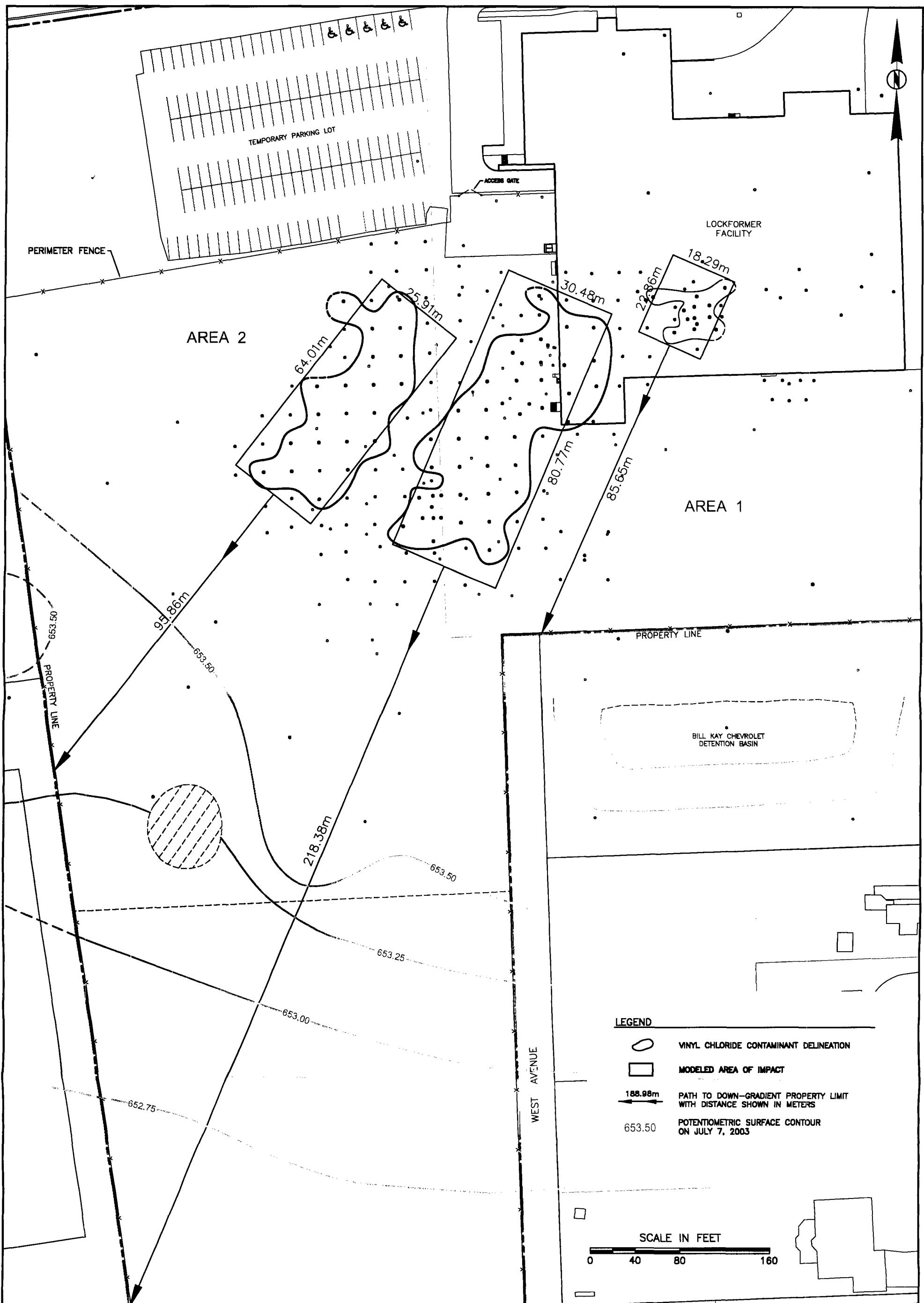
FIGURE

5.1-11



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DATE 3-5-04	
SCALE AS SHOWN	
CAD NO. 6526360012J	
PRJ NO. 65263.60	

CONTAMINANT TRANSPORT MODEL
1,1,1-TRICHLOROETHANE (1,1,1-TCA)
AREAS 1 & 2
THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS



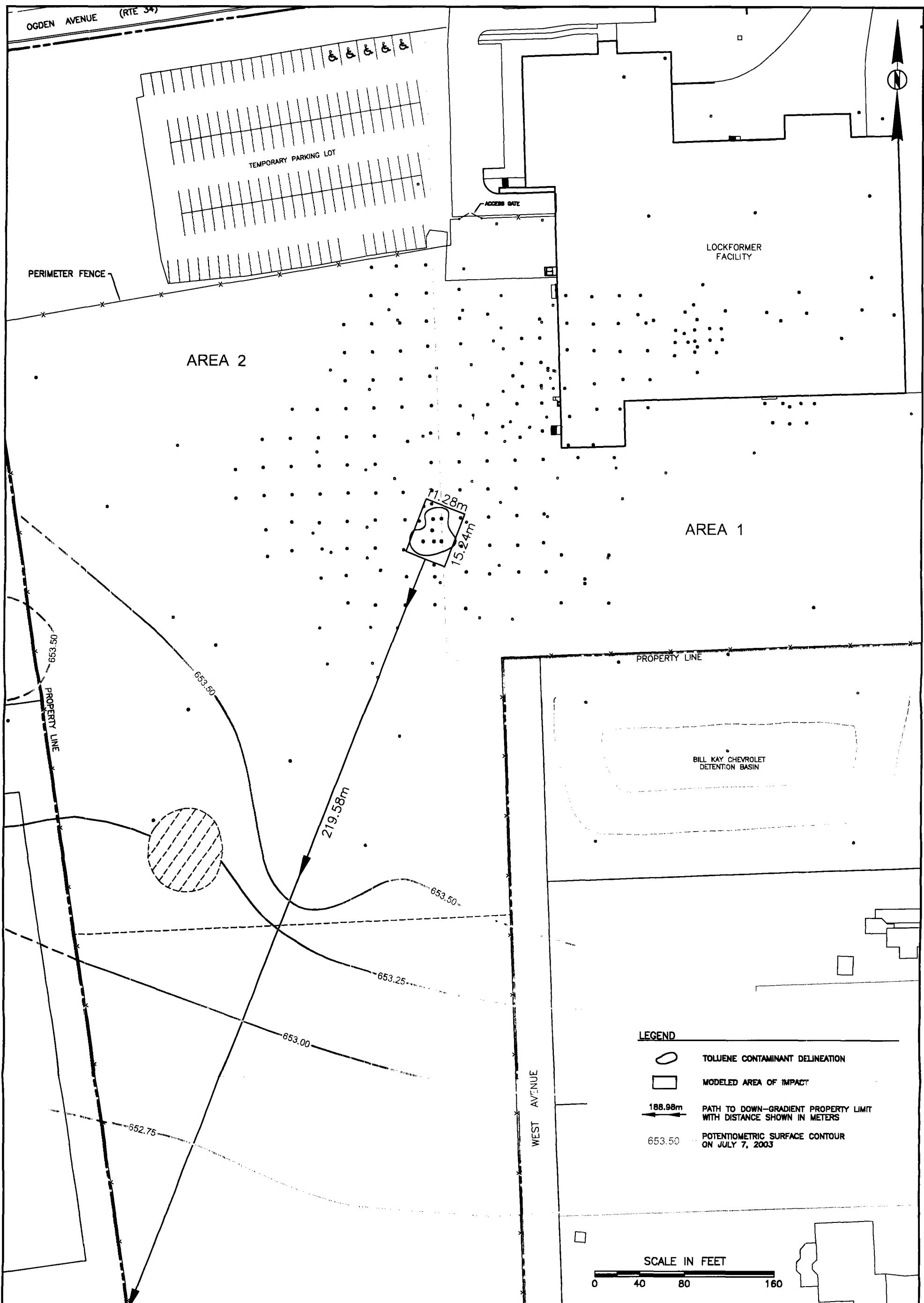
CHECK BY	
DRAWN BY BCP	
DATE 3-5-04	
SCALE AS SHOWN	
CAD NO. 6526360012J	
PRJ NO. 65263.60	

CONTAMINANT TRANSPORT MODEL
VINYL CHLORIDE (VC)
AREAS 1 & 2
THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS

 Clayton®
GROUP SERVICES

FIGURE

5.1-13



CHECK BY	
DRAWN BY BCP	
DATE 3-5-04	
SCALE AS SHOWN	
CAD NO. 6526360012J	
PRJ NO. 65263.60	

CONTAMINANT TRANSPORT MODEL
TOLUENE
AREAS 1 & 2
THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS



FIGURE

5.1-14

GROUND SURFACE (ASPHALT / GRASS)

Source Length Parallel To Groundwater Flow (W)

UPPER FILL / TILL (SILTY CLAY)

- Organic Carbon Content (f_{oc}) = 0.7% (measured)
- pH = 6.8 (default)
- Bulk Density (ρ_s) = 1.72 g/cm³ (measured)
- Total/Effective Porosity (θ_t) = 0.379 (measured)
- Water-Filled Porosity (θ_{ws}) = 0.353 (measured)
- Air-Filled Porosity (θ_{as}) = 0.026 (measured)

• INFILTRATION (I)

• 0.07 m/yr

• Mixing Zone Depth (d) = 0.6 meters

MASS WASTE (SAND / GRAVEL)

Distance to Receptor (X) = Downgradient

WATER TABLE

- pH = 6.8 (default)
- Dispersion in Vertical Plane Limited to Aquifer Thickness (2.0 meters) $\rightarrow \alpha_z = 0$
- Bulk Density (ρ_s) = 1.9 g/cm³ (default for sand/gravel)
- Total Porosity (η) = 0.28 (default for sand/gravel)
- Hydraulic Conductivity (K) = 1.52×10^{-3} cm/sec
- Source Width Perpendicular to GW Flow in Vertical Plane (S_d) = 0.6 meters (equal to mixing zone depth)
- Gradient (i) = 0.0016 in west portion of Area 2 (measured)
- 0.0028 in Area 1 and Area 3 (measured)
- Aquifer Thickness = 2.0 meters

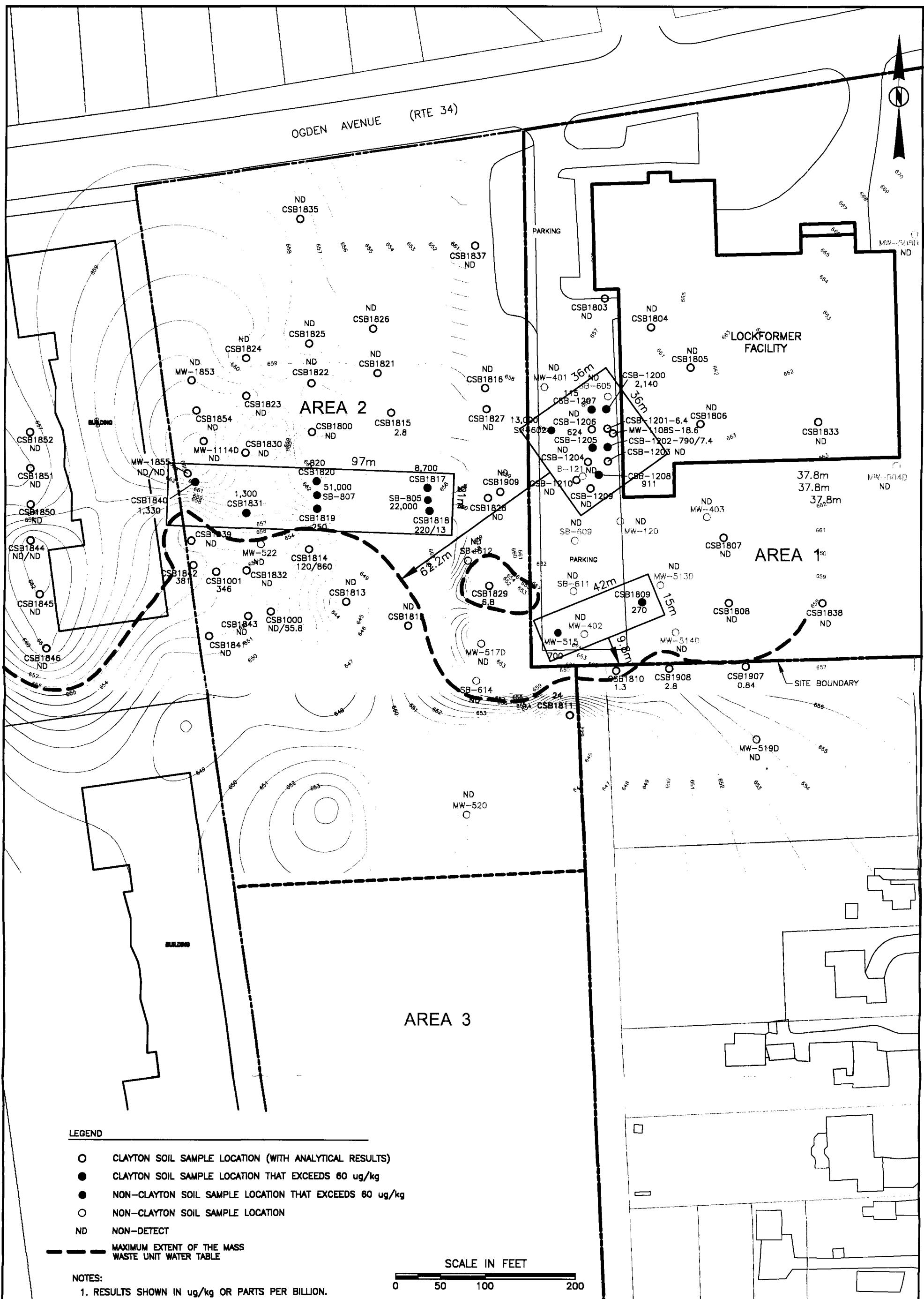
LOWER TILL AQUITARD

CHECK BY	
DRAWN BY BCP	
DATE 3-5-04	
SCALE AS SHOWN	
CAD NO. 65263600120	THE LOCKFORMER COMPANY 711 W. OGDEN AVENUE LISLE, ILLINOIS
PRJ NO. 65263.60	



GRAPHIC MODEL PROFILE

FIGURE
5.1 - 15



CHECK BY	
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DATE	3-5-04
SCALE	AS SHOWN
CAD NO.	6526360012Q
PRJ NO.	65263.60

LOWER TILL SOURCE AREA MAP

IN AREAS 1 AND 2

THE LOCKFORMER COMPANY
711 W. OGDEN AVENUE
LISLE, ILLINOIS



FIGURE

5.2-1

TABLES

TABLE 2-1
Geotechnical Lithologic Analysis

The Lockformer Company / Lisle, Illinois

COMPOUNDS	SAMPLE LOCATION							
	CSB-1000		CSB-1001		CSB-1002		CSB-1203	
	48-50 ft	36-38 ft	42-44 ft	42-48 ft	54-56 ft	43 ft	46 ft	53 ft
Non-Carbonate Organic Carbon (%)	3.78	5.83	0.66	2.29	0.663	0.1805	0.9225	0.669
Grain Size (USCS)	NA	NA	NA	NA	NA	Sandy Gravel, Little Silt, GP-GM	Silty Clay, Trace Sand, Trace Gravel, CL	Silty Clay, Trace Sand, CL
Lithologic Unit	Lower Sand	Mass Waste	Lower Till	Lower Till	Lower Sand	Lower Sand	Lower Till	Lower Till
Moisture Content (%)	NA	NA	NA	NA	NA	NA	18.3	17.9
Specific Gravity	NA	NA	NA	NA	NA	2.70	2.75	2.75
Bulk Density (pounds/ft ³) (dry)	NA	NA	NA	NA	NA	NA	111.8	112.7
Total Porosity (%)	NA	NA	NA	NA	NA	NA	0.35	0.34
Air-filled Porosity (%)	NA	NA	NA	NA	NA	NA	0.02	0.02
Water-filled Porosity (%)	NA	NA	NA	NA	NA	NA	0.33	0.32
Total Organic Matter (%)	NA	NA	NA	NA	NA	NA	NA	NA

NOTES: NA = Not Analyzed

TABLE 2-1
Geotechnical Lithologic Analysis

The Lockformer Company / Lisle, Illinois

COMPOUNDS	SAMPLE LOCATION							
	CSB-1204							
	5 ft	25 ft	33 ft	46 ft	50 ft	54 ft	56 ft	70 ft
Non-Carbonate Organic Carbon (%)	0.7725	0.8055	0.376	0.283	0.872	0.8825	0.243	0.0979
Grain Size (USCS)	Silty Clay, Some Sand, Trace Gravel, CL	Silty Clay, Little Sand, Trace Gravel, CL	Sand, Some Gravel, Little Silt, SW-SM	Sandy Gravel, Trace Silt, Trace Clay, GW-GM	Silty Clay, Trace Sand, Trace Gravel, CL	Silty Clay, Trace Sand, CL	Silty Clay, Some Sand, Trace Gravel, CL	Silty Clay, Some Sand, Trace Gravel, CL
Lithologic Unit	Upper Till/Fill	Upper Till/Fill	Mass Waste	Mass Waste	Lower Till	Lower Till	Lower Sand	Lower Sand
Moisture Content (%)	27.8	21.4	NA	NA	21.7	22.8	11.4	15.3
Specific Gravity	2.75	2.75	2.70	2.70	2.75	2.75	2.79	2.79
Bulk Density (pounds/ft ³) (dry)	95	106.1	NA	NA	106.0	103	129.1	119.2
Total Porosity (%)	0.45	0.38	NA	NA	0.38	0.40	0.26	0.31
Air-filled Porosity (%)	0.02	0.02	NA	NA	0.01	0.02	0.02	0.02
Water-filled Porosity (%)	0.42	0.36	NA	NA	0.37	0.38	0.24	0.29
Total Organic Matter (%)	NA	NA	NA	NA	NA	NA	NA	NA

NOTES: NA = Not Analyzed

TABLE 2-1
Geotechnical Lithologic Analysis

The Lockformer Company / Lisle, Illinois

COMPOUNDS	SAMPLE LOCATION							
	CSB-1205							
	5 ft	26 ft	32 ft	45 ft	49 ft	54 ft	60 ft	73 ft
Non-Carbonate Organic Carbon (%)	0.544	0.812	0.268	0.2635	0.5115	0.8635	0.1835	0.0772
Grain Size (USCS)	Silty Clay, Some Sand, Trace Gravel, CL	Silty Clay, Little Sand, Trace Gravel, CL	Sand, Some Gravel, Little Silt, SP-SM	Gravelly Sand, Little Silt, SW-SM	Silty Clay, Some Sand, CL	Silty Clay, Trace Sand, CL	Silty Clay, Some Sand, Little Gravel, CL	Sand, Little Silt, SP-SM
Lithologic Unit	Upper Till/Fill	Upper Till/Fill	Mass Waste	Mass Waste	Lower Till	Lower Till	Lower Sand	Lower Sand
Moisture Content (%)	22.0	22.6	NA	NA	14.3	20.8	8.6	NA
Specific Gravity	2.79	2.75	2.70	2.70	2.79	2.75	2.79	2.70
Bulk Density (pounds/ft ³) (dry)	102.6	103.6	121.7	NA	121.7	106.3	137.7	NA
Total Porosity (%)	0.41	0.40	NA	NA	0.30	0.38	0.21	NA
Air-filled Porosity (%)	0.05	0.02	NA	NA	0.02	0.03	0.02	NA
Water-filled Porosity (%)	0.36	0.38	NA	NA	0.28	0.35	0.19	NA
Total Organic Matter (%)	NA	NA	NA	NA	NA	NA	NA	NA

NOTES: NA = Not Analyzed

TABLE 2-1
Geotechnical Lithologic Analysis

The Lockformer Company / Lisle, Illinois

COMPOUNDS	SAMPLE LOCATION								
	CSB-1206								
	3 ft	33 ft	36 ft	47 ft	49 ft	53 ft	56 ft	59 ft	75 ft
Non-Carbonate Organic Carbon (%)	0.5505	0.8435	0.2545	0.212	0.6325	0.825	0.688	0.172	0.0854
Grain Size (USCS)	Silty Clay, Little Sand, Trace Gravel, CL	Silty Clay, Little Sand, Trace Gravel, CL	Gravelly Sand, Little Silt, SW-SM	Sand, Trace Gravel, Some Silt, SM	Silty Clay, Trace Sand, CL	Silty Clay, Trace Sand, CL	Silty Clay, Trace Sand, CL	Silty Clay, Some Sand, Trace Gravel, CL	Clayey Sand, Trace Gravel, SC
Lithologic Unit	Upper Till/Fill	Upper Till/Fill	Mass Waste	Mass Waste	Lower Till	Lower Till	Lower Sand	Lower Sand	Lower Sand
Moisture Content (%)	20.0	22.5	NA	NA	18.1	19.1	22.9	10.5	16.1
Specific Gravity	2.75	2.75	2.70	2.70	2.75	2.75	2.75	2.79	2.78
Bulk Density (pounds/ft ³) (dry)	108.1	103.9	NA	NA	112.5	110.5	103.6	131.9	109.1
Total Porosity (%)	0.37	0.39	NA	NA	0.34	0.36	0.40	0.24	0.37
Air-filled Porosity (%)	0.02	0.02	NA	NA	0.02	0.02	0.02	0.02	0.09
Water-filled Porosity (%)	0.35	0.37	NA	NA	0.33	0.34	0.38	0.22	0.28
Total Organic Matter (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES: NA = Not Analyzed

TABLE 2-1
Geotechnical Lithologic Analysis

The Lockformer Company / Lisle, Illinois

COMPOUNDS	SAMPLE LOCATION							
	CSB-1207							
	3 ft	33 ft	36 ft	47 ft	51 ft	64 ft	67 ft	75 ft
Non-Carbonate Organic Carbon (%)	0.472	0.827	0.143	0.27	0.84	0.22	0.06	0.10
Grain Size (USCS)	Silty Clay, Some Sand, Trace Gravel, CL	Silty Clay, Little Sand, Trace Gravel, CL	Gravel, Some Sand, Little Silt, GW-GM	Sand, Little Gravel, Some Silt, SM	Silty Clay, Some Sand, Trace Sand, CL	Silty Clay, Some Sand, Trace Gravel, CL	Silty Sand, Trace Clay, SM	Clayey Sand, SM
Lithologic Unit	Upper Till/Fill	Upper Till/Fill	Mass Waste	Mass Waste	Lower Till	Lower Till	Lower Sand	Lower Sand
Moisture Content (%)	18.3	17.3	NA	NA	19.0	15.0	15.3	17.1
Specific Gravity	2.79	2.79	2.70	2.70	2.75	2.79	2.78	2.78
Bulk Density (pounds/ft ³) (dry)	112.7	114.9	NA	NA	110	119.9	116.4	110.3
Total Porosity (%)	0.35	0.34	NA	NA	0.36	0.31	0.33	0.36
Air-filled Porosity (%)	0.02	0.02	NA	NA	0.02	0.02	0.04	0.06
Water-filled Porosity (%)	0.33	0.32	NA	NA	0.33	0.29	0.29	0.30
Total Organic Matter (%)	NA	NA	NA	NA	NA	NA	NA	NA

NOTES: NA = Not Analyzed

TABLE 2-1
Geotechnical Lithologic Analysis

The Lockformer Company / Lisle, Illinois

COMPOUNDS	SAMPLE LOCATION							
	CSB-1208							
	5 ft	28 ft	32 ft	44 ft	47 ft	52 ft	57 ft	71 ft
Non-Carbonate Organic Carbon (%)	0.89	0.82	0.35	0.27	0.57	0.89	0.17	0.21
Grain Size (USCS)	Silty Clay, Little Sand, Trace Gravel, CL	Silty Clay, Little Sand, Trace Gravel, CL	Sandy Gravel, Little Silt, GW-GM	Sand, Some Gravel, Trace Silt, SP	Silty Clay, Some Sand, Some Gravel, CL	Silty Clay, Trace Sand, CL	Clayey Sand, Some Gravel, SC	Silty Clay, Little Sand, Trace Gravel, CL
Lithologic Unit	Upper Till/Fill	Upper Till/Fill	Mass Waste	Mass Waste	Lower Till	Lower Till	Lower Sand	Lower Sand
Moisture Content (%)	24.5	18.9	NA	NA	17.9	22.4	10.9	13.4
Specific Gravity	2.75	2.75	2.70	2.70	2.78	2.75	2.78	2.79
Bulk Density (pounds/ft ³) (dry)	99.7	110.3	NA	NA	111.1	103.8	130.6	123.8
Total Porosity (%)	0.42	0.36	NA	NA	0.36	0.40	0.25	0.29
Air-filled Porosity (%)	0.03	0.02	NA	NA	0.04	0.02	0.02	0.02
Water-filled Porosity (%)	0.39	0.33	NA	NA	0.32	0.37	0.23	0.27
Total Organic Matter (%)	NA	NA	NA	NA	NA	NA	NA	NA

NOTES: NA = Not Analyzed

TABLE 2-1
Geotechnical Lithologic Analysis

The Lockformer Company / Lisle, Illinois

COMPOUNDS	SAMPLE LOCATION							
	CSB-1209							
	3 ft	29 ft	33 ft	44 ft	46 ft	52 ft	57 ft	70 ft
Non-Carbonate Organic Carbon (%)	0.28	0.81	0.32	0.32	0.86	0.84	0.23	0.08
Grain Size (USCS)	Silty Clay, Little Sand, Little Gravel, CL	Silty Clay, Little Sand, Trace Gravel, CL	Sand, Some Gravel, Little Silt, SP-SM	Gravelly Sand, Little Silt, SW-SM	Silty Clay, Trace Sand, CL	Silty Clay, Trace Sand, CL	Silty Clay, Some Sand, Little Gravel, CL	Silt and Sand, ML
Lithologic Unit	Upper Till/Fill	Upper Till/Fill	Mass Waste	Mass Waste	Lower Till	Lower Till	Lower Sand	Lower Sand
Moisture Content (%)	19.7	21.8	NA	NA	21.0	21.9	13.9	17.5
Specific Gravity	2.79	2.75	2.70	2.70	2.75	2.75	2.79	2.79
Bulk Density (pounds/ft ³) (dry)	106.7	105.4	NA	NA	106.6	104.8	122.6	108.9
Total Porosity (%)	0.39	0.39	NA	NA	0.38	0.39	0.30	0.37
Air-filled Porosity (%)	0.05	0.02	NA	NA	0.02	0.02	0.02	0.07
Water-filled Porosity (%)	0.34	0.37	NA	NA	0.36	0.37	0.27	0.31
Total Organic Matter (%)	NA	NA	NA	NA	NA	NA	NA	NA

NOTES: NA = Not Analyzed

TABLE 2-1
Geotechnical Lithologic Analysis

The Lockformer Company / Lisle, Illinois

COMPOUNDS	SAMPLE LOCATION							
	CSB-1210							
	3 ft	28 ft	31 ft	45 ft	46 ft	54 ft	57 ft	69 ft
Non-Carbonate Organic Carbon (%)	0.48	0.83	0.24	0.31	0.85	0.91	0.45	0.09
Grain Size (USCS)	Silty Clay, Little Sand, Trace Gravel, CL	Silty Clay, Some Sand, Trace Gravel, CL	Sand, Some Gravel, Some Silt, SM	Sand, Some Gravel, Little Silt, SP-SM	Silty Clay, Trace Sand, Little Silt, CL	Silty Clay, Trace Sand, CL	Silty Clay, Some Sand, Little Gravel, CL	Sand, Some Silt, SC
Lithologic Unit	Upper Till/Fill	Upper Till/Fill	Mass Waste	Mass Waste	Lower Till	Lower Till	Lower Sand	Lower Sand
Moisture Content (%)	18.3	16.5	NA	NA	20.7	20.5	12.0	NA
Specific Gravity	2.79	2.79	2.70	2.70	2.75	2.75	2.79	2.70
Bulk Density (pounds/ft ³) (dry)	112.3	117.1	NA	NA	107	107.4	127.7	NA
Total Porosity (%)	0.35	0.33	NA	NA	0.38	0.37	0.27	NA
Air-filled Porosity (%)	0.03	0.02	NA	NA	0.02	0.02	0.02	NA
Water-filled Porosity (%)	0.33	0.31	NA	NA	0.36	0.35	0.25	NA
Total Organic Matter (%)	NA	NA	NA	NA	NA	NA	NA	NA

NOTES: NA = Not Analyzed

TABLE 2-1
Geotechnical Lithologic Analysis

The Lockformer Company / Lisle, Illinois

COMPOUNDS	SAMPLE LOCATION							
	MW-1108S							
	4 ft	32 ft	35 ft	45 ft	49 ft	55 ft	60 ft	75 ft
Non-Carbonate Organic Carbon (%)	0.57	0.82	0.10	0.33	0.74	0.93	0.23	0.13
Grain Size (USCS)	Silty Clay, Little Sand, Trace Gravel, CL	Silty Clay, Some Sand, Trace Gravel, CL	Sand, Little Gravel, Some Silt, SM	Sandy Gravel, Little Silt, GP-GM	Silty Clay, Trace Sand, CL	Silty Clay, Trace Sand, CL	Silty Clay, Some Sand, Some Gravel, CL	Sand, Trace Silt, SP
Lithologic Unit	Upper Till/Fill	Upper Till/Fill	Mass Waste	Mass Waste	Lower Till	Lower Till	Lower Till	Lower Sand
Moisture Content (%)	22.7	17.0	NA	NA	19.3	18.9	12.5	NA
Specific Gravity	2.75	2.79	2.70	2.70	2.75	2.75	2.78	2.70
Bulk Density (pounds/ft ³) (dry)	103.4	115.2	NA	NA	110	109.5	126.4	NA
Total Porosity (%)	0.40	0.34	NA	NA	0.36	0.36	0.27	NA
Air-filled Porosity (%)	0.02	0.02	NA	NA	0.02	0.03	0.02	NA
Water-filled Porosity (%)	0.38	0.31	NA	NA	0.34	0.33	0.25	NA
Total Organic Matter (%)	NA	NA	NA	NA	NA	NA	NA	NA

NOTES: NA = Not Analyzed

TABLE 2-1
Geotechnical Lithologic Analysis

The Lockformer Company / Lisle, Illinois

COMPOUNDS	SAMPLE LOCATION							
	CSB1853			CSB1854	CSB1122A			MW1122S
	38.5	48	52	45.5	43.5	44	46-48	41-43
Non-Carbonate Organic Carbon (%)	NA	NA	NA	NA	NA	NA	NA	NA
Grain Size (USCS)	Silty Clay, Trace Sand, CL	Some Sand, Trace Gravel, ML	Silt, Some Sand, Trace Gravel, ML	Silt, Some Sand, Trace Gravel, ML	Silt, Some Sand, Trace Gravel, ML	NA	Silt, Some Sand, Little Gravel, ML	Clayey Silt, Trace Sand, Trace Gravel, CL-ML
Lithologic Unit	Lower Till	Lower Till	Lower Till	Lower Till	Lower Till	Lower Till	Lower Till	Lower Till
Moisture Content (%)	NA	NA	NA	NA	NA	NA	11.9	18.7
Specific Gravity	NA	NA	NA	NA	NA	NA	NA	NA
Bulk Density (pounds/ft ³) (dry)	NA	NA	NA	NA	NA	NA	139.3	128.5
Total Porosity (%)	NA	NA	NA	NA	NA	NA	NA	NA
Air-filled Porosity (%)	NA	NA	NA	NA	NA	NA	NA	NA
Water-filled Porosity (%)	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Matter (%)	NA	0.4	NA	0.4	NA	0.4	0.6	0.3

NOTES:

TABLE 2-2
Summary of Average Geotechnical Results by Lithologic Unit

The Lockformer Company / Lisle, Illinois

LITHOLOGIC UNIT	FRACTION OF ORGANIC CARBON (foc) (%)	MOISTURE CONTENT (Ow) (%)	BULK DENSITY (Pb) (lb/ft ³)	TOTAL POROSITY (%)	AIR-FILLED POROSITY (%)	WATER-FILLED POROSITY (%)
Fill / Till (1)	0.694	20.71	107.31	0.38	0.03	0.35
Mass Waste (2)	0.2635	ND	ND	ND	ND	ND
Lower Till (3)	0.74 / 0.42 ^(a)	18.7	112.8	0.36	0.02	0.34
Lower Sand (4)	0.192	14.22	120.84	0.30	0.03	0.27

NOTES:

ND = Not Determined

a = first value is the average from the former TCE fill pipe area/second value is the average from west side of Area 2 (excluding 1000-series borings)

Table 3-1
Summary of Hydraulic Conductivity Data in Areas 1 & 2

**Summary of Horizontal Hydraulic Conductivity Data Perfomed by
Slug Test Method (in centimeters/second)**

MASS WASTE SAND AND GRAVEL UNIT			
Well Location	Bower and Rice		
	Well Average K	Falling Head	Rising Head
MW-521	2.12E-02	8.06E-03	3.44E-02
MW-1100S	4.02E-04	5.31E-04	2.72E-04
MW-1101S	5.10E-04	5.80E-04	4.40E-04
MW-1102S	9.91E-04	9.91E-04	no data
MW-1103S	2.80E-03	9.30E-04	4.67E-03
MW-1109	1.70E-03	1.66E-03	1.74E-03
MW-1117	9.08E-04	1.26E-03	5.55E-04
Geomean	1.52E-03		

LOWER CLAYEY SILT TILL UNIT			
Well Location	Bower and Rice		
	Well Average K	Falling Head	Rising Head
MW-1122S	1.52E-05	no data	1.52E-05

LOWER SAND UNIT			
Well Location	Bower and Rice		
	Well Average K	Falling Head	Rising Head
MW-1114S	5.07E-03	6.10E-03	4.03E-03

**Vertical Permeability of the Lower Clayey Silt Till Unit
Performed by Triaxial Chamber and Back Pressure Saturation**

Well Location	Shelby Tube Triaxial Permeability - ASTM D 2937 (in cm/sec)		
	Ave.Triaxial Perm.	41 to 43 feet	46 to 48 feet
MW-1122S	2.92E-07	2.56E-07	3.27E-07

TABLE 3-2
Static Water Levels

The Lockformer Company / Lisle, Illinois

Monitoring Well ID	GW Elev. Aug-98 (msl)	GW Elev. Feb-99 (msl)	GW Elev. Mar-99 (msl)	GW Elev. Dec-99 (msl)	GW Elev. Nov-00 (msl)	GW Elev. 12/19/01 (msl)	GW Elev. 1/11/01 (msl)	GW Elev. 3/21/01 (msl)	GW Elev. 5/15/01 (msl)	GW Elev. 6/27/01 (msl)	GW Elev. 7/12/01 (msl)	GW Elev. 8/10/01 (msl)	GW Elev. 9/10/01 (msl)
BW-1						652.21	656.76	653.70	653.80	653.27	652.76	652.66	652.73
BW-2						652.76	652.51	654.06	654.25	653.64	653.25	653.10	653.14
BW-3						652.90	652.66	654.22	654.40	653.74	653.37	653.22	653.29
P-1						709.58	709.77	709.93					
P-2						668.37	668.16	668.05					
P-3						652.75	652.53	654.06					
MW-101	699.40	702.44	701.63		698.64	697.93	699.49	700.87	699.37	698.57		698.51	
MW-104													
MW-105													
MW-120	675.04	675.19	674.86	674.74	668.50	668.30	668.18	669.32	668.43	660.08		666.12	
MW-123	700.27	702.47	702.48	699.81	700.27	699.90	700.30	701.57	701.10	700.19		700.17	
MW-126	655.80	655.00	654.91	652.92	653.60	653.73	655.26	655.18	654.72	654.08		653.53	
MW-401	657.43	656.73	656.80	655.96	655.73	655.61	655.46	655.83	656.42	656.56		656.31	
MW-402	655.56	657.71	655.81	654.20	654.86	654.17	653.79	655.20	655.94	655.31		654.79	
MW-403	656.15	655.95	655.74	653.47									
MW-500S													
MW-500D		656.26	655.72	655.80	654.49	655.36	654.54	659.85	655.76	655.23		654.63	
MW-501S					695.53	695.98	689.49	692.83					
MW-501D		656.84	656.79	655.23	655.42	655.19	655.01	656.03	656.47	656.41		655.96	
MW-502S	699.40	701.28	701.93	703.73	707.06	707.25	706.66	706.86	707.89	704.09		705.79	
MW-503S					693.39								
MW-504S													
MW-504D		656.11	657.39	653.87	654.81	655.42	658.64	656.48	655.93	655.45		654.88	
MW-505S													
MW-506S													
MW-507S													
MW-508S													
MW-508D		658.30	656.54	653.90	655.00	654.79	654.48	655.47	655.88	655.62		655.04	
MW-513D		656.15	655.76	653.49	654.67	654.01	655.52	655.54	655.73	655.11		654.55	
MW-514D		657.29	655.78	653.71	654.95	654.14	653.76	655.80	655.93	655.27		654.79	
MW-515D		656.57	655.94	653.52	654.81	654.53	657.00	659.62	655.87	655.24		654.70	
MW-516D		656.59	655.94	653.61	654.75	654.07	658.68	658.67	655.87	655.24		654.65	
MW-517D		656.36	655.77	653.67	654.51	653.97	656.53	659.85	655.75	655.18		654.62	
MW-518D				653.46									
MW-519D				653.81									
MW-520					654.05	653.67	653.43	655.22					
MW-521					656.15	653.79	656.00	655.86	655.38	654.91		654.31	
MW-522					654.26	653.76	653.51	655.51	655.81	655.35		654.26	
MW-1100S									656.11	655.39		654.98	
MW-1100D									654.74	654.08	653.66	653.54	653.56
MW-1101S									656.11	655.39		654.95	
MW-1101D									654.73	654.06	653.64	653.52	653.54

TABLE 3-2
Static Water Levels

The Lockformer Company / Lisle, Illinois

Monitoring Well ID	GW Elev. 9/20/01 (msl)	GW Elev. 10/17/01 (msl)	GW Elev. 11/30/01 (msl)	GW Elev. 2/14/02 (msl)	GW Elev. 3/20/02 (msl)	GW Elev. 10/14/2002 (msl)	GW Elev. 11/8/2002 (msl)	GW Elev. 2/6/2003 (msl)	GW Elev. 3/28/2003 (msl)	GW Elev. 7/3/2003 (msl)	GW Elev. 9/24/2003 (msl)	GW Elev. 2/5/2004 (msl)
BW-1	652.64	654.20	653.78	652.65	653.58	652.63	652.04	651.04	651.09	651.93	651.68	651.22
BW-2	653.15	654.81	654.18	653.06	653.98	652.96	652.43	651.45	651.59	652.27	652.04	651.69
BW-3	653.31	654.95	654.31	653.20	654.12	652.95	652.64	651.57	651.72	652.46	652.21	652.13
P-1												
P-2												
P-3												
MW-101	698.67	699.78	698.76	698.49	700.23	697.50	697.13					
MW-104												
MW-105												
MW-120	666.05	666.83	666.89	672.11	670.03	666.76	666.28		657.20	657.26	657.44	657.36
MW-123	700.56	701.55	700.47	700.20	701.32	699.51	699.06		700.26	701.86	702.42	702.42
MW-126	653.50	655.16	654.60	653.47	654.37	653.10	652.84		651.82	652.60	652.37	652.14
MW-401	655.99	656.02	656.45	655.99	655.95	656.54	656.33		707.67			
MW-402	654.93	657.29	655.83	654.60	655.37	654.42	653.96		652.48	653.65	653.61	653.40
MW-403												
MW-500S												
MW-500D	654.39	656.08	655.57	654.36	655.08	654.27	653.86					
MW-501S												
MW-501D	655.58	656.06	656.23	655.51	655.86	655.62	655.35					
MW-502S	707.22	706.80	709.36	706.44	705.61	703.17	704.98		706.17	702.08	706.45	701.68
MW-503S												
MW-504S												
MW-504D	654.69	655.62	655.72	654.57	655.13	654.55	654.18		652.92	653.79	653.83	653.47
MW-505S												
MW-506S												
MW-507S												
MW-508S												
MW-508D	654.74	655.13	655.63	654.55	654.97	654.68	654.35		652.59	653.44	653.50	653.18
MW-513D	654.71	656.29	655.53	654.39	655.09	654.17	653.84		652.45	653.43	653.33	653.05
MW-514D	655.18	656.91				654.51	654.13		652.76	653.78	653.75	653.45
MW-515D	654.78	657.05	655.69	654.52	655.27	654.35	653.91		652.42	653.55	653.52	653.30
MW-516D	654.88	657.36	655.72	654.50	655.36	654.22	653.83		652.34	653.48	653.50	653.27
MW-517D	654.41	656.36	655.64	654.38	655.14	654.28	653.86		652.44	653.51	652.85	653.30
MW-518D												
MW-519D												
MW-520												
MW-521	654.11	655.11	655.30	654.11	654.93	653.96	653.64		652.34	653.37	653.26	653.16
MW-522	654.18	655.12	655.70	654.14	655.13	653.93	653.55		652.25	653.27	653.06	652.89
MW-1100S	655.60	658.09	655.92	654.76	655.63	654.47	654.01		652.74	653.81	653.81	653.47
MW-1100D	653.54	655.15	654.57	653.47	654.40	653.18	652.99		651.87	652.67	652.45	652.22
MW-1101S	655.62	657.72	655.91	654.80	655.64	654.45	654.01		652.72	653.81	653.82	653.47
MW-1101D	653.54	655.12	654.55	653.46	654.38	653.18	653.00		651.88	652.66	652.45	652.22

TABLE 3-2
Static Water Levels

The Lockformer Company / Lisle, Illinois

Monitoring Well ID	GW Elev. Aug-98 (msl)	GW Elev. Feb-99 (msl)	GW Elev. Mar-99 (msl)	GW Elev. Dec-99 (msl)	GW Elev. Nov-00 (msl)	GW Elev. 12/19/01 (msl)	GW Elev. 1/11/01 (msl)	GW Elev. 3/21/01 (msl)	GW Elev. 5/15/01 (msl)	GW Elev. 6/27/01 (msl)	GW Elev. 7/12/01 (msl)	GW Elev. 8/10/01 (msl)	GW Elev. 9/10/01 (msl)
MW-1102S									655.48	654.90			654.31
MW-1102D									654.68	654.05	653.65	653.55	653.58
MW-1103S									655.33	654.79			654.23
MW-1103M									654.72	654.11			653.57
MW-1103D									654.68	654.04	653.64	653.54	653.55
MW-1104S									655.14	654.66			654.08
MW-1104D									654.84	654.20	653.79	653.67	653.72
MW-1105D									654.87	654.26	653.85	653.73	653.77
MW-1106D									655.06	654.46	654.03	653.91	653.96
MW-1107D									654.87	654.32	653.90	653.78	653.81
MW-1108S									654.75	654.16			653.58
MW-1108D													653.60
MW-1109									655.48	654.91		654.32	
MW-1110S													
MW-1110D													653.97
MW-1111S													
MW-1111D													653.94
MW-1112S													
MW-1112D													653.86
MW-1113S													
MW-1113M													
MW-1113D													
MW-1114S													
MW-1114D													
MW-1115S													
MW-1115M													
MW-1115D													
MW-1116S													
MW-1116M													
MW-1116D													
MW-1117													
MW-1118													
MW-1119D													
MW1119M													
MW1119S													
MW-1120D													
MW-1121D													
MW-1122S													
MW-1122													
MW-1123													
MW-1600S													
MW-1600D													

TABLE 3-2
Static Water Levels

The Lockformer Company / Lisle, Illinois

Monitoring Well ID	GW Elev. 9/20/01 (msl)	GW Elev. 10/17/01 (msl)	GW Elev. 11/30/01 (msl)	GW Elev. 2/14/02 (msl)	GW Elev. 3/20/02 (msl)	GW Elev. 10/14/2002 (msl)	GW Elev. 11/8/2002 (msl)	GW Elev. 2/6/2003 (msl)	GW Elev. 3/28/2003 (msl)	GW Elev. 7/3/2003 (msl)	GW Elev. 9/24/2003 (msl)	GW Elev. 2/5/2004 (msl)
MW-1102S	654.11	656.37	655.27	654.36	655.22	653.99	653.62		652.48	653.46	653.46	653.20
MW-1102D	653.54	655.27	654.55	653.49	654.37	653.21	652.93		651.93	652.72	652.51	652.27
MW-1103S	654.07	656.07	654.62	654.30	655.11	653.87	653.54		652.43	653.39	653.35	653.18
MW-1103M	653.62	654.84	655.09	653.51	654.41	653.16	652.96		651.86	652.64	652.43	652.19
MW-1103D	653.61	655.65	654.56	653.48	654.35	653.22	653.02		651.93	652.71	652.50	652.27
MW-1104S	653.93	655.42	654.98	653.99	654.84	653.73	653.38		651.86	653.22	653.09	652.97
MW-1104D	653.73	655.42	654.69	653.60	654.52	653.33	653.14		652.04	652.84	652.63	652.41
MW-1105D	653.79	655.48	654.73	653.64	654.57	653.38	653.16		652.09	652.88	652.66	652.43
MW-1106D	653.96	655.70	664.88	653.80	654.76	653.56	653.34		652.19	653.05	652.85	652.62
MW-1107D	653.78	655.48	654.83	653.68	654.54	653.41	653.22		652.05	652.89	652.69	652.42
MW-1108S	653.58	655.24	654.66	653.51	654.41	653.18	652.99					652.32
MW-1108D		655.63	654.88	653.76	654.62	653.42	653.21					652.49
MW-1109	654.10	656.29	655.24	654.35	655.20	654.21	653.85		652.71	653.66	653.67	653.42
MW-1110S	654.03	655.82	654.97	653.86	654.82	653.56	653.29		652.30	653.00		652.58
MW-1110D	652.20	655.83	654.95	653.83	654.83	653.55	653.29		652.31	653.13		652.68
MW-1111S	654.01	655.90	654.89	653.81	654.80	653.57	653.24		652.39	653.10		652.66
MW-1111D	653.98	655.75	654.93	653.78	654.76	653.47	653.25		652.25	652.85		652.40
MW-1112S	654.18	655.33	655.28	654.17	655.00	654.03	653.67		652.53	653.42		653.19
MW-1112D	653.90	655.64	654.91	653.74	654.69	653.43	653.18		652.24	652.81		652.38
MW-1113S	653.52	655.30	654.58	653.54	654.54	653.30	652.98		652.01	652.97	652.86	652.73
MW-1113M	653.45	655.07	654.51	653.44	655.32	653.05	652.80		651.77	652.63	652.40	652.17
MW-1113D	653.46	655.08	654.51	653.44	654.54	653.12	652.89		651.87	652.63	652.41	652.16
MW-1114S	653.98	655.76	654.89	653.85	654.76	653.53	653.22		652.17	652.97	652.75	652.54
MW-1114D	653.98	655.74	654.91	653.82	654.76	653.53	653.28		652.20	653.06	652.81	652.60
MW-1115S		654.34	653.24	654.17	653.01	652.73			651.81	652.49	652.25	652.03
MW-1115M					653.01	652.75			651.72	652.49	652.25	652.03
MW-1115D					653.12	652.82			651.78	652.54	652.30	652.07
MW-1116S		654.34	652.55	654.20	653.03	652.76			651.76	652.52	652.27	652.05
MW-1116M					653.04	652.77			651.76	652.51	652.26	652.05
MW-1116D					653.09	652.84			651.78	652.50	652.31	652.09
MW-1117					654.18	653.81			652.47	653.57	653.42	653.32
MW-1118					653.58	653.32			652.21	652.99	652.81	652.62
MW-1119D					653.10	652.80			651.80	652.53	652.31	652.08
MW-1119M										652.46	652.21	651.99
MW-1119S										652.49	652.24	652.02
MW-1120D					653.12	652.94			651.88	652.57	652.34	652.14
MW-1121D					653.11	652.82			651.83	652.55	652.33	652.10
MW-1122S												653.26
MW-1122						653.30			652.22	653.05	652.81	652.58
MW-1123									652.71	653.79		653.76
MW-1600S			652.04	650.76	651.58							
MW-1600D			651.91	650.63	651.66							

TABLE 3-2
Static Water Levels

The Lockformer Company / Lisle, Illinois

Monitoring Well ID	GW Elev. Aug-98 (msl)	GW Elev. Feb-99 (msl)	GW Elev. Mar-99 (msl)	GW Elev. Dec-99 (msl)	GW Elev. Nov-00 (msl)	GW Elev. 12/19/01 (msl)	GW Elev. 1/11/01 (msl)	GW Elev. 3/21/01 (msl)	GW Elev. 5/15/01 (msl)	GW Elev. 6/27/01 (msl)	GW Elev. 7/12/01 (msl)	GW Elev. 8/10/01 (msl)	GW Elev. 9/10/01 (msl)
MW-1601S													
MW-1601D													
MW-1602S													
MW-1602D													
MW-1603													
MW-1604													
MW-1604D													
MW-1605													
MW-1853													
MW-1855													
MW1915													
MW1919													
MW1923													
MW-2100D													
MW-2100M													
MW-2100S													
MW-2101													
MW-2102													
MW-2103													
MW2114													
MW2116													
MW2129													
MW2130D													
MW2130S													
MW2131D													
MW2131S													
MW2300D													
MW2300M													
MW2300S													
MW2301D													
MW2301M													
MW2301S													
MW2306													
MW2311													
RW1													
RW2													
RW3													
RW4													
RW5													
RW6													
RW7													
RW8													

TABLE 3-2
Static Water Levels

The Lockformer Company / Lisle, Illinois

Monitoring Well ID	GW Elev. 9/20/01 (msl)	GW Elev. 10/17/01 (msl)	GW Elev. 11/30/01 (msl)	GW Elev. 2/14/02 (msl)	GW Elev. 3/20/02 (msl)	GW Elev. 10/14/2002 (msl)	GW Elev. 11/8/2002 (msl)	GW Elev. 2/6/2003 (msl)	GW Elev. 3/28/2003 (msl)	GW Elev. 7/3/2003 (msl)	GW Elev. 9/24/2003 (msl)	GW Elev. 2/5/2004 (msl)
MW-1601S			653.16	651.65								
MW-1601D			652.69	651.29								
MW-1602S			654.00	652.77	653.60							
MW-1602D			653.68	652.42	653.33							
MW-1603			654.24	653.23	654.20	652.98	652.60	651.68	651.48	652.26	651.99	651.84
MW-1604			654.15	652.99	653.92	652.74	652.44	651.43	651.62	652.29	652.05	651.68
MW-1604D									651.56	652.30	652.05	651.73
MW-1605			654.07	652.92	653.80	652.77	652.37	651.30	651.45	652.16	651.94	651.56
MW-1853												
MW-1855												
MW1915										652.77	652.51	652.40
MW1919										655.47	654.87	655.25
MW1923										652.64	652.41	652.25
MW-2100D						653.11	652.81		651.78	652.53	652.31	652.07
MW-2100M						653.02	652.72		651.76	652.52	652.27	652.05
MW-2100S						653.02	652.73		651.75	652.51	652.26	652.04
MW-2101						653.05	652.77	651.78	651.75	652.53	652.28	652.06
MW-2102						653.05	652.77	651.78	651.78	652.52	652.27	652.05
MW-2103						653.06	652.51	651.79	651.78	652.53	652.28	652.06
MW2114										652.58	652.35	652.15
MW2116										653.05	652.98	652.76
MW2129										652.66		652.24
MW2130D										652.52		652.04
MW2130S										652.50		652.03
MW2131D										657.08		652.03
MW2131S										652.51		652.03
MW2300D										652.47	652.22	651.92
MW2300M										652.54	652.27	651.97
MW2300S										652.57	652.28	652.03
MW2301D										652.44	652.19	650.90
MW2301M										652.51	652.24	652.95
MW2301S										652.52	652.24	651.95
MW2306										652.53	652.25	651.98
MW2311										652.45	652.17	651.88
RW1							650.16		648.98	649.71	649.44	648.81
RW2							650.22		649.08	649.79	649.51	648.90
RW3							650.34		649.19	649.88	649.61	649.01
RW4							650.44		649.29	649.99	649.71	649.11
RW5							650.50		649.37	650.07	649.82	649.10
RW6							649.34		648.16	648.88	648.58	647.92
RW7									647.98	648.73	648.38	648.02
RW8									648.00	648.74	648.39	647.95

TABLE 3-2
Static Water Levels

The Lockformer Company / Lisle, Illinois

Monitoring Well ID	GW Elev. Aug-98 (msl)	GW Elev. Feb-99 (msl)	GW Elev. Mar-99 (msl)	GW Elev. Dec-99 (msl)	GW Elev. Nov-00 (msl)	GW Elev. 12/19/01 (msl)	GW Elev. 1/11/01 (msl)	GW Elev. 3/21/01 (msl)	GW Elev. 5/15/01 (msl)	GW Elev. 6/27/01 (msl)	GW Elev. 7/12/01 (msl)	GW Elev. 8/10/01 (msl)	GW Elev. 9/10/01 (msl)
RW9													
RW10													
RW11													
RW12													
SG-1								671.33	670.59	670.41		670.51	670.66
SG-2								666.99	666.44	666.32	666.27	666.41	666.51
SG-3								664.12	663.34	663.20	663.04	663.37	663.48
SG-4											664.34	664.53	664.74
SG-5											656.80	656.96	657.14
SG-6											651.93	652.40	652.71
Katrine Well											648.49		650.12
Finley Well											669.08		667.20
Downer Dr. Well											652.42		651.94
67th St. Well											641.35		640.86
71st St. Well											641.86		641.54
63rd St. Well													646.77

TABLE 3-2
Static Water Levels

The Lockformer Company / Lisle, Illinois

Monitoring Well ID	GW Elev. 9/20/01 (msl)	GW Elev. 10/17/01 (msl)	GW Elev. 11/30/01 (msl)	GW Elev. 2/14/02 (msl)	GW Elev. 3/20/02 (msl)	GW Elev. 10/14/2002 (msl)	GW Elev. 11/8/2002 (msl)	GW Elev. 2/6/2003 (msl)	GW Elev. 3/28/2003 (msl)	GW Elev. 7/3/2003 (msl)	GW Elev. 9/24/2003 (msl)	GW Elev. 2/5/2004 (msl)	
RW9										647.94	648.68	648.35	647.86
RW10										647.86	648.61	648.28	647.75
RW11										647.62	648.39	648.07	647.55
RW12										648.17	647.87	647.24	
SG-1	670.94	670.98	670.85	670.71	670.60	670.04	670.10		671.30		670.43		
SG-2	666.72	666.93	666.83	666.65	666.57	666.14	666.35		666.93	666.21	666.33		
SG-3	663.73	663.71	663.64	663.46	663.42	663.16	663.35		663.95	663.16	663.29		
SG-4	666.46	665.61	665.20	664.64	664.61	664.49	664.40		664.68	664.31	664.45	664.30	
SG-5	658.72	658.09	657.42	657.02	657.02	656.69	656.77		657.25	656.53	656.78	656.69	
SG-6	654.98	654.26	653.16	652.68	652.47	651.96	652.03		652.82	652.00	652.07	652.05	
Katrine Well			649.81	648.19	649.14		648.16		646.96	647.71	647.07	647.34	
Finley Well			670.35	669.78	671.10		667.84		667.56	667.67	666.35	668.09	
Downer Dr. Well			653.41	652.43	652.56		652.05		650.99	651.36	650.81	651.13	
67th St. Well			642.19	641.34	641.15		641.25		640.40	640.55	639.95	640.25	
71st St. Well			643.09	641.83	642.09		641.22		640.20	640.78	639.91	640.41	
63rd St. Well			647.12	645.99	646.01		645.27		644.34	644.7	643.98	644.63	

msl = mean sea level

GW = Ground Water

Shaded cells = Not Applicable

Depth to groundwater measured from the top of the well casing.

TABLE 3-3
Vertical Hydraulic Gradients between the Mass Waste Unit and Silurian Dolomite in Areas 1 and 2

The Lockformer Company / Lisle, Illinois

WELLS															
	May-01			Jun-01			Aug-01			Sep-01					
MW-1100S	↓	656.11	6.23E-02	↓	655.39	5.95E-02	↓	654.98	6.55E-02	↓	655.60	9.36E-02			
MW-1100D		654.74			654.08			653.54			653.54				
MW-1101S	↓	656.11	6.57E-02	↓	655.39	6.33E-02	↓	654.95	6.81E-02	↓	655.62	9.90E-02			
MW-1101D		654.73			654.06			653.52			653.54				
MW-1102S	↓	655.48	4.85E-02	↓	654.90	5.15E-02	↓	654.31	4.61E-02	↓	654.11	3.45E-02			
MW-1102D		654.68			654.05			653.55			653.54				
MW-1103S	↓	655.33	4.06E-02	↓	654.79	4.69E-02	↓	654.23	4.31E-02	↓	654.07	2.88E-02			
MW-1103D		654.68			654.04			653.54			653.61				
MW-1104S	↓	655.14	1.87E-02	↓	654.66	2.87E-02	↓	654.08	2.56E-02	↓	653.93	1.25E-02			
MW-1104D		654.84			654.20			653.67			653.73				
MW-1112S											↓	654.18			
MW-1112D												653.90			

TABLE 3-3
Vertical Hydraulic Gradients between the Mass Waste Unit and Silurian Dolomite in Areas 1 and 2

The Lockformer Company / Lisle, Illinois

WELLS												
	Oct-01			Nov-01			Feb-02			Mar-02		
MW-1100S		658.09	1.33E-01		655.92	6.14E-02		654.76	5.86E-02		655.63	5.59E-02
MW-1100D		655.17			654.57			653.47			654.40	
MW-1101S		657.72	1.24E-01		655.91	6.48E-02		654.80	6.38E-02		655.64	6.00E-02
MW-1101D		655.12			654.55			653.46			654.38	
MW-1102S		656.37	6.67E-02		655.27	4.36E-02		654.36	5.27E-02		655.22	5.15E-02
MW-1102D		655.27			654.55			653.49			654.37	
MW-1103S		656.07	2.63E-02		654.62	3.75E-03		654.30	5.12E-02		655.11	4.75E-02
MW-1103D		655.65			654.56			653.48			654.35	
MW-1104S		655.42	0.00E+00		654.98	1.81E-02		653.99	2.44E-02		654.84	2.00E-02
MW-1104D		655.42			654.69			653.60			654.52	
MW-1112S		655.33	2.82E-02		655.28	3.36E-02		654.17	3.91E-02		655.00	2.82E-02
MW-1112D		655.64			654.91			653.74			654.69	

TABLE 3-3
Vertical Hydraulic Gradients between the Mass Waste Unit and Silurian Dolomite in Areas 1 and 2

The Lockformer Company / Lisle, Illinois

WELLS												
	Oct-02			Nov-02			Mar-03			Jul-03		
MW-1100S	↓	654.47	5.86E-02	↓	654.01	4.64E-02	↓	652.74	3.95E-02	↓	653.81	5.18E-02
MW-1100D		653.18			652.99			651.87			652.67	
MW-1101S	↓	654.45	6.05E-02	↓	654.01	4.81E-02	↓	652.72	4.00E-02	↓	653.81	5.48E-02
MW-1101D		653.18			653.00			651.88			652.66	
MW-1102S	↓	653.99	4.73E-02	↓	653.62	4.18E-02	↓	652.48	3.33E-02	↓	653.39	4.06E-02
MW-1102D		653.21			652.93			651.93			652.72	
MW-1103S	↓	653.87	4.06E-02	↓	653.54	3.25E-02	↓	652.43	3.13E-02	↓	653.39	4.25E-02
MW-1103D		653.22			653.02			651.93			652.71	
MW-1104S	↓	653.73	2.50E-02	↓	653.38	1.50E-02	↑	651.86	1.12E-02	↓	653.22	2.37E-02
MW-1104D		653.33			653.14			652.04			652.84	
MW-1112S	↓	654.03	5.45E-02	↓	653.67	4.45E-02	↓	652.53	2.64E-02	↓	653.42	5.55E-02
MW-1112D		653.43			653.18			652.24			652.81	

TABLE 3-3
Vertical Hydraulic Gradients between the Mass Waste Unit and Silurian Dolomite in Areas 1 and 2

The Lockformer Company / Lisle, Illinois

WELLS	Sep-03			Feb-04			AVG "i"
MW-1100S		653.81	6.18E-02		653.47	5.68E-02	
MW-1100D		652.45			652.22		
MW-1101S		653.82	6.52E-02		653.47	5.95E-02	
MW-1101D		652.45			652.22		
MW-1102S		653.46	5.76E-02		653.20	5.64E-02	
MW-1102D		652.51			652.27		
MW-1103S		653.35	5.31E-02		653.18	5.69E-02	
MW-1103D		652.50			652.27		
MW-1104S		653.09	2.88E-02		652.97	3.50E-02	
MW-1104D		652.63			652.41		
MW-1112S					653.19	7.36E-02	
MW-1112D					652.38		

Geomean "i" 4.40E-02

TABLE 5.1-1
Summary of Delineation Objectives
Upper Till/Fill in Areas 1 and 2

The Lockformer Company / Lisle, Illinois

Compound	Delineation Objective (mg/kg)
Acetone	16
Benzene	0.03
Bromodichloromethane	0.6
Bromoform	0.8
Bromomethane	0.2
2-Butanone	NE
Carbon disulfide	9
Carbon tetrachloride	0.07
Chlorobenzene	1
Chlorodibromomethane	0.4
Chloroethane	NE
Chloroform	0.3
Chloromethane	NE
1,1-Dichloroethane	23
1,2-Dichloroethane	0.02
1,1-Dichloroethene	0.06
cis-1,2-Dichloroethene	0.4
trans-1,2-Dichloroethene	0.7
1,2-Dichloropropane	0.03
cis-1,3-Dichloropropene	0.004
trans-1,3-Dichloropropene	
Ethylbenzene	13
2-Hexanone	NE
4-Methyl-2-pentanone	NE
Methylene chloride	0.02
Styrene	4
1,1,2,2-Tetrachloroethane	NE
Tetrachloroethene	0.06
Toluene	12
1,1,1-Trichloroethane	2
1,1,2-Trichloroethane	0.02
Trichloroethene	0.06
Vinyl acetate	10
Vinyl chloride	0.01
Xylenes (total)	150

NOTES:

NE = Not Established

Delineation objective based on the most conservative value contained in Appendix B, Tables A and B of 35 IAC 742.

TABLE 5.1-2
RBCA Equation "R26" Support Information
Upper Till/Fill in Areas 1 and 2

The Lockformer Company / Lisle, Illinois

Compound of Concern	^a Distance to Receptor (X) (meters)	Source Width Perpendicular to the Groundwater Flow Direction in the Horizontal Plane (S_w) (meters)
cis-1,2-Dichloroethene		
Former Fill Pipe Area	215.61	27.43
Area 2	93.47	19.81
Former Vapor Degreaser Area	94.64	12.19
trans-1,2-Dichloroethene		
Former Fill Pipe Area	215.61	27.43
Former Vapor Degreaser Area	92.57	7.01
Tetrachloroethene		
Former Fill Pipe Area	212.57	27.43
Area 2	101.31	16.76
Former Vapor Degreaser Area	87.33	10.67
Trichloroethene		
Former Fill Pipe Area	188.98	35.05
Area 2	93.28	37.8
Former Vapor Degreaser Area	87.61	37.8
1,1,1-Trichloroethane		
Former Fill Pipe Area	212.17	25
Vinyl Chloride		
Former Fill Pipe Area	218.38	30.48
Area 2	95.86	25.91
Former Vapor Degreaser Area	85.65	18.29
Toluene		
Former Fill Pipe Area	219.58	11.28

NOTES:

^a Distance to downgradient property limits (illustrated in Figures 5.1-9 through 5.1-14)

First Order Degradation Constants and Solubility Limits were obtained from 35 IAC742, Appendix C, Table E.

TABLE 5.1-3
SSL Support Information
Upper Till/Fill in Areas 1 and 2

The Lockformer Company / Lisle, Illinois

Compound of Concern	Groundwater Objective at the Downgradient Edge of the Source Area (GW _{obj}) (mg/L)	Soil-Water Partitioning Coefficient (K _d) (L/kg)	*Soil Saturation Limit (C _{sat}) (mg/kg)
cis-1,2-Dichloroethene		0.249	1596.9
Former Fill Pipe Area	15.7		
Area 2	10.3		
Former Vapor Degreaser Area	3.37		
trans-1,2-Dichloroethene		0.368	3644.88
Former Fill Pipe Area	22.4		
Former Vapor Degreaser Area	7.89		
Tetrachloroethene		1.09	260.33
Former Fill Pipe Area	^b 200		
Area 2	142		
Former Vapor Degreaser Area	9.46		
Trichloroethene		1.16	1510.97
Former Fill Pipe Area	5.25		
Area 2	1.64		
Former Vapor Degreaser Area	0.346		
1,1,1-Trichloroethane		0.77	1311.23
Former Fill Pipe Area	^b 1330		
Vinyl Chloride		0.13	972.1
Former Fill Pipe Area	0.843		
Area 2	0.247		
Former Vapor Degreaser Area	0.104		
Toluene		1.27	780.24
Former Fill Pipe Area	^b 526		

NOTES:

SSL = Soil Screening Level

Organic Carbon Partitioning Coefficients (Koc) were obtained from 35 IAC742, Appendix C, Table E.

^a Calculated using SSL equation "S29" presented in 35 IAC 742, Appendix C, Table A.

^b Default value equal to the compound specific solubility limit.

TABLE 5.1-4
Soil Remediation Objectives
Soil Component of the Groundwater Ingestion Exposure Route
Upper Till/Fill in Areas 1 and 2

The Lockformer Company / Lisle, Illinois

Compound of Concern	^a GW _{obj} (mg/L)	Calculated SRO for the Soil Component of the Groundwater Ingestion Exposure Route - SSL Procedures (mg/kg)
cis-1,2-Dichloroethene		
Former Fill Pipe Area	15.7	143.265
Area 2	10.3	93.990
Former Vapor Degreaser Area	3.37	30.752
trans-1,2-Dichloroethene		
Former Fill Pipe Area	22.4	259.191
Former Vapor Degreaser Area	7.89	91.296
Tetrachloroethene		
Former Fill Pipe Area	^b 200	^c 260
Area 2	142	^c 260
Former Vapor Degreaser Area	9.46	246.268
Trichloroethene		
Former Fill Pipe Area	5.25	144.229
Area 2	1.64	45.055
Former Vapor Degreaser Area	0.346	9.505
1,1,1-Trichloroethane		
Former Fill Pipe Area	^b 1330	^c 1310
Vinyl Chloride		
Former Fill Pipe Area	0.843	5.938
Area 2	0.247	1.740
Former Vapor Degreaser Area	0.104	0.733
Toluene		
Former Fill Pipe Area	^b 526	^c 780

NOTES:

GW_{obj} = Groundwater Concentration at the Source

SRO = Soil Remediation Objective

SSL = Soil Screening Level

^a GW_{source} determined using equation "R26" and substituted as GW_{obj} in SSL Procedures.

^b Default value equal to the compound specific solubility limit.

^c Default value equal to the compound specific soil saturation limit.

TABLE 5.1-5
Soil Remediation Objective Comparison Table
Upper Till/Fill in Areas 1 and 2

The Lockformer Company / Lisle, Illinois

Compound of Concern	Calculated SRO for the Soil Component of the Groundwater Ingestion Exposure Route SSL Procedures (mg/kg)	Existing Soil RAO	Final SRO for the Upper Fill/Till Silty Clay (mg/kg)
cis-1,2-Dichloroethene			
Former Fill Pipe Area	143.265	1200	143.265
Area 2	93.990	1200	93.990
Former Vapor Degreaser Area	30.752	1200	30.752
trans-1,2-Dichloroethene			
Former Fill Pipe Area	259.191	3100	259.191
Former Vapor Degreaser Area	91.296	3100	91.296
Tetrachloroethene			
Former Fill Pipe Area	^a 260	20	20
Area 2	^a 260	20	20
Former Vapor Degreaser Area	246.268	20	20
Trichloroethene			
Former Fill Pipe Area	144.229	8.9	8.9
Area 2	45.055	8.9	8.9
Former Vapor Degreaser Area	9.505	8.9	8.9
1,1,1-Trichloroethane			
Former Fill Pipe Area	^a 1310	1200	1200
Vinyl Chloride			
Former Fill Pipe Area	5.938	1.1	1.1
Area 2	1.740	1.1	1.1
Former Vapor Degreaser Area	0.733	1.1	0.733
Toluene			
Former Fill Pipe Area	^a 780	650	650

NOTES:

SRO = Soil Remediation Objective

SSL = Soil Screening Level

RAO = Removal Action Objective

Bold values identify the concentrations selected as the final SRO for the upper fill/till silty clay.

^a Default value equal to the compound specific soil saturation limit.



APPENDIX A

SOIL BORING LOGS AND MONITORING WELL LOGS



BORING NO: MW1853	WELL NO: MW1853	PROJECT NO: 15-65263.10-001	PROJECT NAME: Lockformer						
BORING LOCATION: Northwest section of Area 2		COORDINATES: NA							
DRILLING CO: Mid-America	DRILLER: Jeremy Heiser		LOGGED BY: J. Campbell						
DRILLING EQUIP: Track D-50	SCREEN INTERVAL: 27.5'-32.5' bgs		CHECKED BY:						
STATIC WATER LEVEL: NA	SCREEN MTL/SLOT: SS/0.010		START DATE: 12/11/03						
BOREHOLE DIA: 8.25"	STICKUP:		START TIME (hours): 805						
TOP of CASING ELEVATION: NA	G.S. ELEVATION: NA		FINISH DATE: 12/11/03						
RISER DIA/MTL/LGTH: 2"/SS/34.9	DEV. METHODS: NA		FINISH TIME (hours): 1250						
DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES			PID		REMARKS
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	
-2 ft m									
0	Blind drilled to 25.0' bgs	██████████	██████████						
2									
4									
6									
8									
10									
12									
14									
16									



BORING NO: MW1853		WELL NO: MW1853		PROJECT NO: 15-65263.10-001		PROJECT NAME: Lockformer					
DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES			PID		HEADSPACE	REMARKS	
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN		
19											
21											
23	7										
25	SAND AND GRAVEL (GW) Brown, moist, fine to coarse sand, fine to coarse gravel, trace clay, some silt, loose			1/2	SS	M	--	--	--		
27				1/2	SS	M	--	--	--		
29	9			1/2	SS	M	--	--	--		
31	NO RECOVERY (31.0' to 33.0')			0/2	SS	M	--	--	--		
33	SILTY CLAY (CL) (32.5' to 34.0') Gray, moist, trace coarse sand, trace coarse gravel, cohesive, stiff, till			1.5/2	SS	M	--	--	--		
35	End of Boring at 34.0' bgs										
37	11										



GROUP SERVICES

BORING NO: MW1855	WELL NO: MW1855	PROJECT NO: 15-65263.10-001	PROJECT NAME: Lockformer							
BORING LOCATION: Northwest section of Area 2		COORDINATES: NA								
DRILLING CO: Mid-America	DRILLER: Denny McCoy		LOGGED BY: J. Campbell							
DRILLING EQUIP: Diedrich D-120	SCREEN INTERVAL: 34.0'-36.0' bgs		CHECKED BY:							
STATIC WATER LEVEL: NA	SCREEN MTL/SLOT: SS/0.010		START DATE: 12/01/03							
BOREHOLE DIA: 8.25"	STICKUP:		START TIME (hours): 959							
TOP of CASING ELEVATION: NA	G.S. ELEVATION: NA		FINISH DATE: 12/01/03							
RISER DIA/MTL/LGTH: 2"/SS/36.4	DEV. METHODS: NA		FINISH TIME (hours): 1417							
DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES				PID	HEADSPACE	REMARKS
				NUMBER	RECOVERY	METHOD	MOISTURE			
ft m										
-2										
0	Blind drilled to 32.0' bgs									
2										
4										
6										
8										
10										
12										
14										
16										



BORING NO: MW1855		WELL NO: MW1855		PROJECT NO: 15-65263.10-00		PROJECT NAME: Lockformer					
DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES				PID		HEADSPACE	REMARKS
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN		
19											
21											
23	7										
25											
27											
29	9										
31											
33	SILTY CLAY (CL) Gray, moist, trace coarse sand, firm, cohesive			1/2	SS	M	60 60 3"	--	--		
35	SAND AND GRAVEL (GW) Brown, moist, fine to coarse sand, fine to coarse gravel, trace clay, some silt, loose			.5/2	SS	M	30 25 17 20	-	-		
37	11 SILTY CLAY (CL) Gray, moist, trace coarse sand, trace coarse gravel, cohesive, stiff, till			1/1	SS	M	4 6	--	--		



GROUP SERVICES

BORING NO: MW1122S	WELL NO: MW1122S	PROJECT NO: 15-65263.10-001	PROJECT NAME: Lockformer							
BORING LOCATION: Northwest section of Area 2		COORDINATES: NA								
DRILLING CO: Mid-America	DRILLER: Brian		LOGGED BY: J. Campbell							
DRILLING EQUIP: Diedrich D-120	SCREEN INTERVAL: 45.12' to 47.12'		CHECKED BY:							
STATIC WATER LEVEL: NA	SCREEN MTL/SLOT: SS/0.010		START DATE: 11/04/03							
BOREHOLE DIA: 8.25"	STICKUP: 1.80'		START TIME (hours): 1430							
TOP of CASING ELEVATION: NA	G.S. ELEVATION: NA		FINISH DATE: 11/04/03							
RISER DIA/MTL/LGTH: 2"/SS/47.30"	DEV. METHODS: NA		FINISH TIME (hours): 1720							
DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES				PID		REMARKS
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN	
-2 ft m										
0	Blind drilled to 35.0' bgs									
2										
4										
6										
8										
10										
12										
14										
16										
18										



BORING NO: MW1122S		WELL NO: MW1122S		PROJECT NO: 15-65263.10-001		PROJECT NAME: Lockformer						
DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES			PID		REMARKS			
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN	HEADSPACE		
20												
22												
7												
24												
26												
28												
9												
30												
32												
34												
36	SAND AND GRAVEL (GW) Brown, moist, fine to coarse sand, fine to coarse gravel, trace clay, some silt, loose	D 100 D 100 D 100 D 100			1/2	SS	M	40 33 33 50	--	--		
11	SILTY CLAY (CL) Gray, moist, trace coarse sand, trace coarse gravel, cohesive, stiff, till				.3/2	SS	M	45 50	--	--		
38												

BORING NO: MW1122S		WELL NO: MW1122S		PROJECT NO: 15-65263.10-00		PROJECT NAME: Lockformer					
DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES				PID		REMARKS	
				NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN	HEADSPACE	
40	SAND AND GRAVEL (GW) Brown, moist, fine to coarse sand, fine to coarse gravel, loose							10 12 15 24	-	-	
42	SILTY CLAY (CL) Gray, moist, trace coarse sand and fine gravel, cohesive, firm, till			1/2	SS	M/W					
44				--	SS	-	-		-	-	
46				1.2/2	SS	W	11 12 10 12		-	-	
48	End of Boring at 47.5' BGS			.8/2	SS	W	11 11 15 20		-	-	
50											
52											
54											
56											
58											



BORING NO: CSB-1853		PROJECT NO: 65263.01-001			PROJECT NAME: Lockformer				
BORING LOCATION: Northwest portion of Area 2					COORDINATES: NA				
DRILLING CO: Mid-America			DRILLER: Larry Ranken						
DRILLING EQUIP: Diedrich D-120			BOREHOLE DIA: 8.25"						
START DATE: 10/29/03		FINISH DATE: 10/30/03			LOGGED BY: J. Campbell				
START TIME (hours): 0855		FINISH TIME (hours): 1210			CHECKED BY:				
DEPTH	DESCRIPTION	GRAPHIC	SAMPLES				PID		REMARKS
			NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN	
ft m									
0 0	TOPSOIL Silty clay, dark brown, moist, soft, organics								Elevation- 695.23
2			1.5/2	SS M	11 14 19 22	--	--		
4	SILTY CLAY (CL) Brown, moist, trace coarse sand, stiff, cohesive, till		2/2	SS M	10 12 19 22	--	--		
6			2/2	SS M	9 14 22 26	--	--		
8			2/2	SS M	7 11 18 23	--	--		
10			1.5/2	SS M	9 18 26 36	--	--		
12			1.5/2	SS M	6 11 19 15	--	--		
14	SAND AND GRAVEL (GW) Brown, moist, fine to coarse grained sand, fine to coarse gravel, some silt, trace clay, loose		1.5/2	SS M	8 9 20 16	--	--		
16			.5/2	SS M	9 25 33 25	--	--		
18			1.2/2	SS M	11 20 28 43	--	--		
20			.4/2	SS M	15 50	--	--		

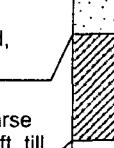
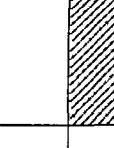
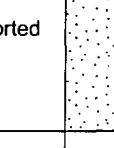


BORING NO: CSB-1853

PROJECT NO: 65263.01-001

PROJECT NAME: Lockformer

DEPTH	DESCRIPTION	GRAPHIC	SAMPLES				PID		REMARKS
			NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN	
22			.8/2	SS	M	20 50 3"	-	-	
24			.2/2	SS	M	14 17 50 3"	-	-	
26			1/2	SS	M	25 26 21 20	-	-	
28			1.5/2	SS	M	14 16 17 19	-	-	
30			1/2	SS	M	24 21 17 17	-	-	
32	NO RECOVERY		0/2	SS	-	50 4"	-	-	
34	SILTY CLAY (CL) Gray, very moist, stiff, cohesive, high plasticity, trace coarse sand CLAYEY SILT (ML) Gray, very moist, cohesive, low plasticity		2/2	SS	M	9 12 13 18	-	-	VOCs
36			2/2	SS	M	6 12 14 12	-	-	
38			2/2	SS	M	10 15 9 10	--	--	Particle size
40	NO RECOVERY Large cobble at 39.0' bgs		0/2	SS	-	50 5"	--	--	

BORING NO: CSB-1853		PROJECT NO: 65263.01-001		PROJECT NAME: Lockformer						
DEPTH	DESCRIPTION	GRAPHIC	SAMPLES				PID		REMARKS	
			NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN	HEADSPACE	
42	SAND (SP) Light gray, very moist, fine grained, well sorted, sand lens CLAYEY SILT (ML) Gray, very moist, some fine to coarse sand and fine gravel, cohesive, soft, till		1.2/2	SS	VM		17 15 22 21	-	-	
44	NO RECOVERY		0/2	SS	-	--		-	-	
46			.5/2	SS	VM		3 4 6 7	-	-	
48			1.2/2	SS	VM		3 3 5 8	-	-	Particle size
50	NO RECOVERY		0/2	SS	VM		4 6 8 8	-	-	
52	Wet at 51.0' bgs		1.2/2	SS	W		5 6 8 7	-	-	Particle size
54	SAND (SP) Gray, wet, medium grained, well sorted		2/2	SS	W		0 0 0 0	-	-	
56	Endo of Boring at 55.0' BGS									
58										
60										



BORING NO: CSB-1854	PROJECT NO: 65263.01-001	PROJECT NAME: Lockformer						
BORING LOCATION: Northwest portion of Area 2			COORDINATES: NA					
DRILLING CO: Mid-America			DRILLER: Larry Ranken					
DRILLING EQUIP: Diedrich D-120			BOREHOLE DIA: 8.25"					
START DATE: 10/29/03 START TIME (hours): 1130	FINISH DATE: 10/30/03 FINISH TIME (hours): 907			LOGGED BY: J. Campbell			CHECKED BY:	
DEPTH ft m	DESCRIPTION	GRAPHIC	SAMPLES			PID		REMARKS
			NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	
0 0	TOPSOIL Silty clay, dark brown, moist, soft, organics, cohesive							Elevation- 695.15
2	SILTY CLAY (CL) Brown, moist, gray mottles, trace coarse sand, stiff, cohesive, till		1.5/2	SS	M	8 12 15 17	--	
4			1.5/2	SS	M	8 10 17 23	--	
6			1.5/2	SS	M	9 14 15 17	--	
8			2/2	SS	M	6 9 15 19	--	
10			1.5/2	SS	M	8 20 12 15	--	
12			2/2	SS	M	9 11 15 17	--	
14	SAND AND GRAVEL (GW) Brown, moist, fine to coarse grained sand, fine to coarse gravel, some silt, trace clay, loose		.8/2	SS	M	8 14 18 25	--	
16			.8/2	SS	M	12 11 14 15	--	
18			1.5/2	SS	M	11 14 16 23	--	
20			.8/2	SS	M	4 23 47	--	



BORING NO: CSB-1854		PROJECT NO: 65263.01-001		PROJECT NAME: Lockformer						
DEPTH	DESCRIPTION	GRAPHIC	SAMPLES				PID		REMARKS	
			NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN	HEADSPACE	
22	NO RECOVERY			0/2	SS	-	50 5"	-	-	
24			.3/2	SS	-		9 50 5"	M	-	
26	NO RECOVERY			0/2	SS	-	50 0"	-	-	
28			.5/2	SS	M		9 27 23 33	-	-	
30			1/2	SS	M		9 32 25 46	-	-	
32	SILTY CLAY (CL) Gray, moist, cohesive, high plasticity, trace coarse sand			2/2	SS	M	30 20 12 17	-	-	VOCs
34	CLAYEY SILT (ML) Gray, moist, cohesive, some fine sand, till More clay at 35.0' bgs -intermittent fine grained sand seams			2/2	SS	M	9 11 12 11	-	-	VOCs
36			1.5/2	SS	M		7 15 19 24	-	-	
38	NO RECOVERY Large cobble at 37.0' bgs		0/2	SS	-		50 5"	--	--	
40			1.2/2	SS	M		8 22 23	--	--	



BORING NO: CSB-1854

PROJECT NO: 65263.01-001

PROJECT NAME: Lockformer

DEPTH	DESCRIPTION	GRAPHIC	SAMPLES				PID		REMARKS
			NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN	
42	CLAYEY SILT (ML) Light brown/gray, moist, some fine to coarse sand and fine gravel, cohesive, soft, till Very moist at 42.5' bgs Wet at 43.0' bgs		1/2	SS	VM		17 19 10 9	-	-
44			1.3/2	SS	W		10 15 6 7	-	-
46			2/2	SS	W		4 6 7 7	-	-
48			.5/2	SS	W		4 3 2 4	--	-
50	SAND (SP) Gray, wet, medium grained, well sorted, loose		2/2	SS	W		1 1 6 14	-	-
52	End of Boring at 51.0' BGS								
54									
56									
58									
60									



BORING NO: CSB-1855	PROJECT NO: 65263.01-001	PROJECT NAME: Lockformer								
BORING LOCATION: Northwest portion of Area 2			COORDINATES: NA							
DRILLING CO: Mid-America			DRILLER: Larry Ranken							
DRILLING EQUIP: Diedrich D-120			BOREHOLE DIA: 8.25"							
START DATE: 10/30/03	FINISH DATE: 11/04/03			LOGGED BY: J. Campbell						
START TIME (hours): 1620	FINISH TIME (hours): 930			CHECKED BY:						
DEPTH	DESCRIPTION	GRAPHIC	NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	PID	HEADSPACE	REMARKS
0 ft m 0	TOPSOIL Silty clay, dark brown, moist, soft, organics, cohesive									Elevation- 694.78
2	SILTY CLAY (CL) Light brown, moist, trace coarse sand, stiff, cohesive, till		.8/2	SS	M	11 20 33 40	--	--		
4			2/2	SS	M	9 16 21 27	--	--		
6	SILT (ML) Tan, dry, cohesive, very well sorted									
8	SAND (SP) Reddish brown, moist, fine grained, trace silt, very well sorted, loose		1.2/2	SS	M	5 9 8 8	--	--		
10										
12	SAND AND GRAVEL (GW) Reddish brown, moist, fine to coarse grained sand, fine to coarse gravel, some silt, trace clay, loose, very poorly sorted		1.2/2	SS	M	12 18 18 19	--	--		
14										
16			1/2	SS	M	8 32 37 41	--	--		
18			1.2/2	SS	M	11 23 18 19	--	--		
20			1/2	SS	M	15 10 15 16	--	--		
			1.2/2	SS	M	15 25 23 15	--	--		
			1/2	SS	M	5 31 26	--	--		



BORING NO: CSB-1855

PROJECT NO: 65263.01-001

PROJECT NAME: Lockformer

DEPTH	DESCRIPTION	GRAPHIC	SAMPLES				PID		REMARKS
			NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN	
22			.5/2	SS	M		25 50 5"	-	-
24			.5/2	SS	M		31 50 4"	-	-
26	NO RECOVERY		0/2	SS	-		50 0"	-	-
28			.5/2	SS	M		26 50 3"	-	-
30	SILTY CLAY (CL) Gray, moist, cohesive, stiff, trace coarse sand		.1/2	SS	M		50 2"	-	-
32			1.6/2	SS	M		11 12 12 10	-	-
34			.5/2	SS	M		30 50 2"	-	-
36	SAND AND GRAVEL (GW) Brown, moist, fine to coarse sand, fine to coarse gravel, some silt, trace clay, loose		1.8/2	SS	M		33 20 24 24	-	-
38	SILTY CLAY (CL) Gray, moist, trace coarse sand, cohesive, medium plasticity		0/2	SS	-		16 50 4"	-	-
40	NO RECOVERY		2/2	SS	W		20 23 23	-	-



BORING NO: CSB-1855		PROJECT NO: 65263.01-001		PROJECT NAME: Lockformer						
DEPTH	DESCRIPTION	GRAPHIC	SAMPLES				PID		REMARKS	
			NUMBER	RECOVERY	METHOD	MOISTURE	BLOW CNT (6")	SCAN	HEADSPACE	
42	SILT (ML) Light brown/gray, wet, with fine sand, trace clay, cohesive, till CLAYEY SILT (ML) Gray, wet, some fine sand, cohesive, soft, till						20 45 23 23	-	-	
44			1/2	SS	W		7 12 17 11	-	-	
46	Intermittent fine sand layers 47.0' to 49.0' bgs		1.5/2	SS	W		2 10 25 35	-	-	
48			1.2/2	SS	W		10 16 14 24	-	-	
50	SAND (SP) Gray, wet, medium grained, well sorted, loose		2/2	SS	W		8 12 15 12	-	-	
52	End of Boring at 51.0' BGS									
54										
56										
58										
60										

APPENDIX B

GEOTECHNICAL ANALYSES OF SHELBY TUBE AND SPLIT-SPOON SAMPLES

**SCHLEEDE
HAMPTON
ASSOCIATES**

CONSULTING ENGINEERS

INC

December 6, 2003

Mr. William Elwell
Clayton Group Services
3140 Finley Road
Downers Grove, IL 60515

Re: Laboratory Testing Services
Lockformer
Lisle, IL
SHA File No. 73371

Dear Mr. Elwell:

Schleede-Hampton Associates, Inc. has completed the laboratory testing on material submitted for the above referenced project. The samples were picked up by SHA at your office on November 7, 2003.

Laboratory Test Methods

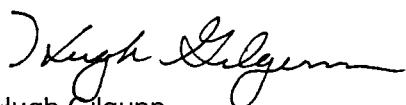
The samples were tested in accordance with the following standard methods of test:

Grain Size Analysis	ASTM D 422
Total Organic Matter	ASTM D 2974
Moisture Content of Soils	ASTM D 2216
Bulk Density Determination	ASTM D 2937
Permeability Using Triaxial Chamber and Back Pressure Saturation	ASTM D 5084

Results of the laboratory testing are summarized on the attached Table 1. Laboratory test data is attached.

Thank you for the opportunity to be of service. If you have any questions regarding the test data, please contact us at your convenience.

Very truly yours,
SCHLEEDE-HAMPTON ASSOCIATES, INC.


Hugh Gilgunn

Project Engineer

HG/dsc
Attachments

CORPORATE OFFICE

FROM /
REPLY
TO:

3966 WEST DAYTON STREET, SUITE D
 McHENRY, ILLINOIS 60050-8376
815-578-8900 • FAX: 815-578-8862

LABORATORY

1612 LANDMEIER ROAD, UNIT C
ELK GROVE VILLAGE, ILLINOIS 60007-2463
847-228-1079 • FAX: 847-228-0633

LABORATORY

3966 WEST DAYTON STREET, SUITE A
 McHENRY, ILLINOIS 60050-8376
815-385-8351 • FAX: 815-385-8456

Lockformer

Boring No.	Depth (ft.)	Moisture Content	Bulk Density (pcf)	Total Organic Carbon	Total Organic Matter	Permeability (cm/sec)	Classification
CSB 1853	38.5	--	--	--	--	--	Silty CLAY, Trace Sand, CL
CSB 1853	48.0	--	--	N.E.S.	0.4%	--	SILT, Some Sand, Trace Gravel, ML
CSB 1853	52.0	--	--	--	--	--	SILT, Some Sand, Trace Gravel, ML
CSB 1854	45.5	--	--	N.E.S.	0.4%	--	SILT, Some Sand, Trace Gravel, ML
CSB 1122A	43.5	--	--	--	--	--	SILT, Some Sand, ML
CSB 1122A	44.0	--	--	N.E.S.	0.4%	--	--
CSB 1122A	46-48	11.9%	139.3	N.E.S.	0.6%	3.27E-07	SILT, Some Sand, Little Gravel, ML
MW 1122S	41-43	18.7%	128.5	N.E.S.	0.3%	2.56E-07	Clayey SILT, Trace Sand, Trace Gravel, CL-ML

N.E.S. - Not Enough Sample.

Table 1

REPORT OF PERMEABILITY TESTING

PROJECT NAME LockformerSAMPLE NO. MW-1122S, 41'-43'CLASSIFICATION Clayey SILT, Trace Sand, Trace Gravel, CL-MLSAMPLE TYPE 3" SHELBY TUBEREPORT NO: 1 permDATE: Nov-03PROJECT NO: 73371METHOD OF TEST ASTM D-5084-90

Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

PERMEANT LIQUID Tap WaterTOTAL BACK PRESSURE 30 psiTEMPERATURE, °C 20EFF. CONSOLIDATION STRESS, max 0.72 tsfCELL PRESSURE, psi 40EFF. CONSOLIDATION STRESS, min 0.62 tsfHYDRAULIC GRADIENT, i 9.1PERMEABILITY, k
(cm/sec)TEST INTERVAL 1 2.78E-07TEST INTERVAL 2 2.50E-07TEST INTERVAL 3 2.47E-07TEST INTERVAL 4 2.49E-07AVERAGE k 2.56E-07k 20 2.56E-07

SAMPLE DATA:

DIAMETER, in

INITIAL

FINAL

LENGTH, in

2.862.87

VOLUME, cu in

4.354.25

WEIGHT, gm

27.9527.48

UNIT WEIGHT,pcf

943.8951.0

MOIST. CONTENT, %

128.5131.7

DRY DENSITY, pcf

18.719.6

REE OF SATUR, %

108.3110.191100

SCHLEEDE-HAMPTON ASSOCIATES, INC.

• CONSULTING ENGINEERS

REPORT OF PERMEABILITY TESTING

PROJECT NAME Lockformer

SAMPLE NO. CSB-1122A, 46'-48'

CLASSIFICATION SILT, Some Sand, Little Gravel, ML

SAMPLE TYPE 3" SHELBY TUBE

REPORT NO: 2 perm

DATE: Nov-03

PROJECT NO: 73371

METHOD OF TEST ASTM D-5084-90

Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

PERMEANT LIQUID Tap Water

TOTAL BACK PRESSURE 30 psi

TEMPERATURE, °C 20

EFF. CONSOLIDATION STRESS, max 0.72 tsf

CELL PRESSURE, psi 40

EFF. CONSOLIDATION STRESS, min 0.62 tsf

HYDRAULIC GRADIENT, i 7.1

PERMEABILITY, k
(cm/sec)

TEST INTERVAL 1 3.28E-07

TEST INTERVAL 2 2.99E-07

TEST INTERVAL 3 3.51E-07

TEST INTERVAL 4 3.31E-07

AVERAGE k 3.27E-07

k 20 3.27E-07

SAMPLE DATA:

DIAMETER, in

INITIAL

FINAL

2.82

2.83

LENGTH, in

5.60

5.46

VOLUME, cu in

35.00

34.35

WEIGHT, gm

1280.7

1284.1

UNIT WEIGHT, pcf

139.3

142.3

MOIST. CONTENT, %

11.9

12.2

DRY DENSITY, pcf

124.5

126.8

REE OF SATUR, %

91

100

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3165

Project Name: Lockformer

ProjectID: 73371

Date: 12/4/2003

Boring No. CSB-1853

Sample No. 0

Depth: 38.5

Test No. 1

Total Sample Wt.: 224.9

	Sieve Size	Cum Wt. Ret	% Retaining	% Passing	Total Passing %	Dia (mm)
+#10 Sieve Portion.	1	0.0	0.0	100.0	100.0	25.0000
	3/4	0.0	0.0	100.0	100.0	19.0000
	1/2	0.0	0.0	100.0	100.0	12.5000
	3/8	0.0	0.0	100.0	100.0	9.5000
	No.4	0.0	0.0	100.0	100.0	4.7500
	No.10	0.0	0.0	100.0	100.0	2.0000
-#10 Sieve Portion.	No.20	0.0	0.0	100.0	100.0	0.8500
	No.40	0.0	0.0	100.0	100.0	0.4200
	No.100	0.0	0.0	100.0	100.0	0.1500
	No.200	0.6	1.1	98.9	98.9	0.0750

Wt of Sample at Start of Hydrometer : 51.9

Temperature (C): 22.5

Temp Bath Bulb Reading: 5.5

Specific Gravity: 2.70

	Elaps. Time (min)	Uncorrected	Corrected	% Passing	Total Passing %	Dia (mm)
Hydrometer Portion.	1	52.5	47.4	90.4	90.4	0.0364
	2	49.0	43.9	83.7	83.7	0.0267
	5	45.5	40.4	77.0	77.0	0.0174
	15	38.0	32.9	62.7	62.7	0.0108
	30	33.5	28.4	54.2	54.2	0.0079
	60	29.0	23.9	45.6	45.6	0.0058
	120	25.5	20.4	38.9	38.9	0.0042
	250	23.5	18.4	35.1	35.1	0.0029
	1440	17.5	12.4	23.6	23.6	0.0013

LL :

PL:

PI :

Organic : No

Gravel :

0

Sand :

1

Silt : 70

Clay : 29

Cu: 9.8

Cc:

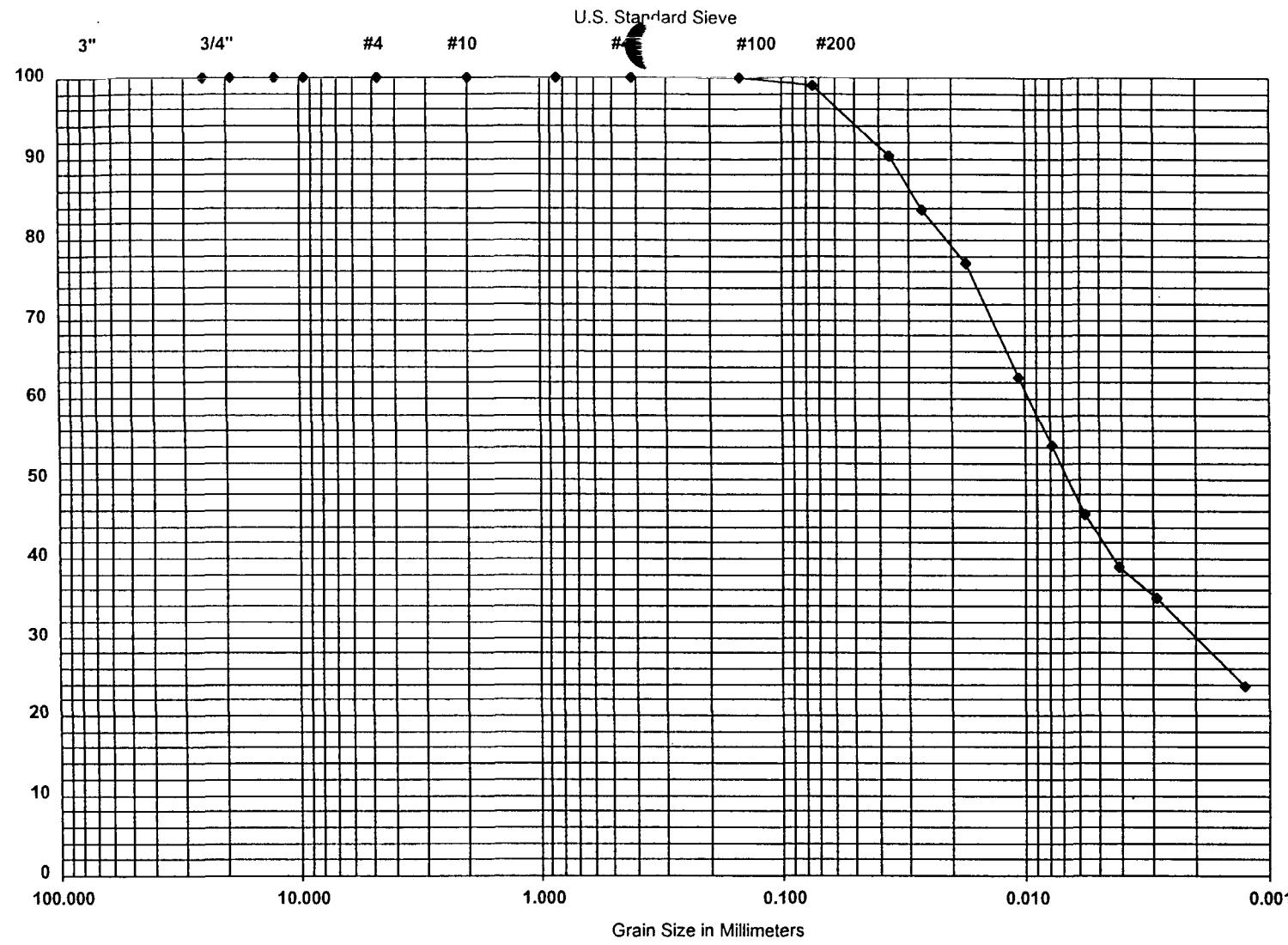
0.5

D10: 0.001

D30: 0.002

D60: 0.01

Unified Classification: Silty CLAY, Trace Sand, CL



GRAVEL		SAND			SILT OR CLAY		
coarse	fine	coarse	medium	fine			

Boring No.: CSB-1853 Sample No.: 0 Depth: 38.5 LL%: PL %: PI %:
 Gravel: 0 Sand: 1 Silt: 70 Clay: 29 Cu: 9.8 Cc: 0.5 Dia10: 0.001 Dia30: 0.002 Dia60: 0.010

Unified Classification: Silty CLAY, Trace Sand, CL

Project Name: Lockformer

Client: Clayton Group, Inc.

ProjectID: 73371

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3166

Project Name: Lockformer

ProjectID: 73371

Date: 12/4/2003

Boring No. CSB-1853

Sample No. 0

Depth: 48

Test No. 2

Total Sample Wt.: 228.8

	Sieve Size	Cum Wt. Ret	% Retaining	% Passing	Total Passing %	Dia (mm)
Sieve Portion.	+#10	1	0.0	100.0	100.0	25.0000
	3/4	0.0	0.0	100.0	100.0	19.0000
	1/2	4.6	2.0	98.0	98.0	12.5000
	3/8	13.0	5.7	94.3	94.3	9.5000
	No.4	21.4	9.4	90.6	90.6	4.7500
	No.10	32.6	14.3	85.7	85.7	2.0000
Sieve Portion.	-#10	No.20	3.3	6.4	93.6	0.8500
	No.40	5.9	11.5	88.5	75.9	0.4200
	No.100	11.5	22.3	77.7	66.6	0.1500
	No.200	16.2	31.5	68.5	58.7	0.0750

Wt of Sample at Start of Hydrometer : 51.4

Temperature (C): 22.5

Temp Bath Bulb Reading: 5.5

Specific Gravity: 2.70

Hydrometer Portion.	Elaps. Time (min)	Uncorrected	Corrected	% Passing	Total Passing %	Dia (mm)
	1	33.0	27.9	53.7	46.0	0.0433
	2	28.5	23.4	45.0	38.6	0.0316
	5	25.5	20.4	39.2	33.6	0.0204
	15	18.5	13.4	25.8	22.1	0.0123
	30	15.0	9.9	19.0	16.3	0.0089
	60	13.0	7.9	15.2	13.0	0.0064
	120	11.0	5.9	11.3	9.7	0.0046
	250	10.5	5.4	10.4	8.9	0.0032
	1440	8.5	3.4	6.5	5.6	0.0013

LL :

PL:

PI :

Organic : No

Gravel : 9

Sand : 32

Silt : 52

Clay : 7

Cu: 18.5

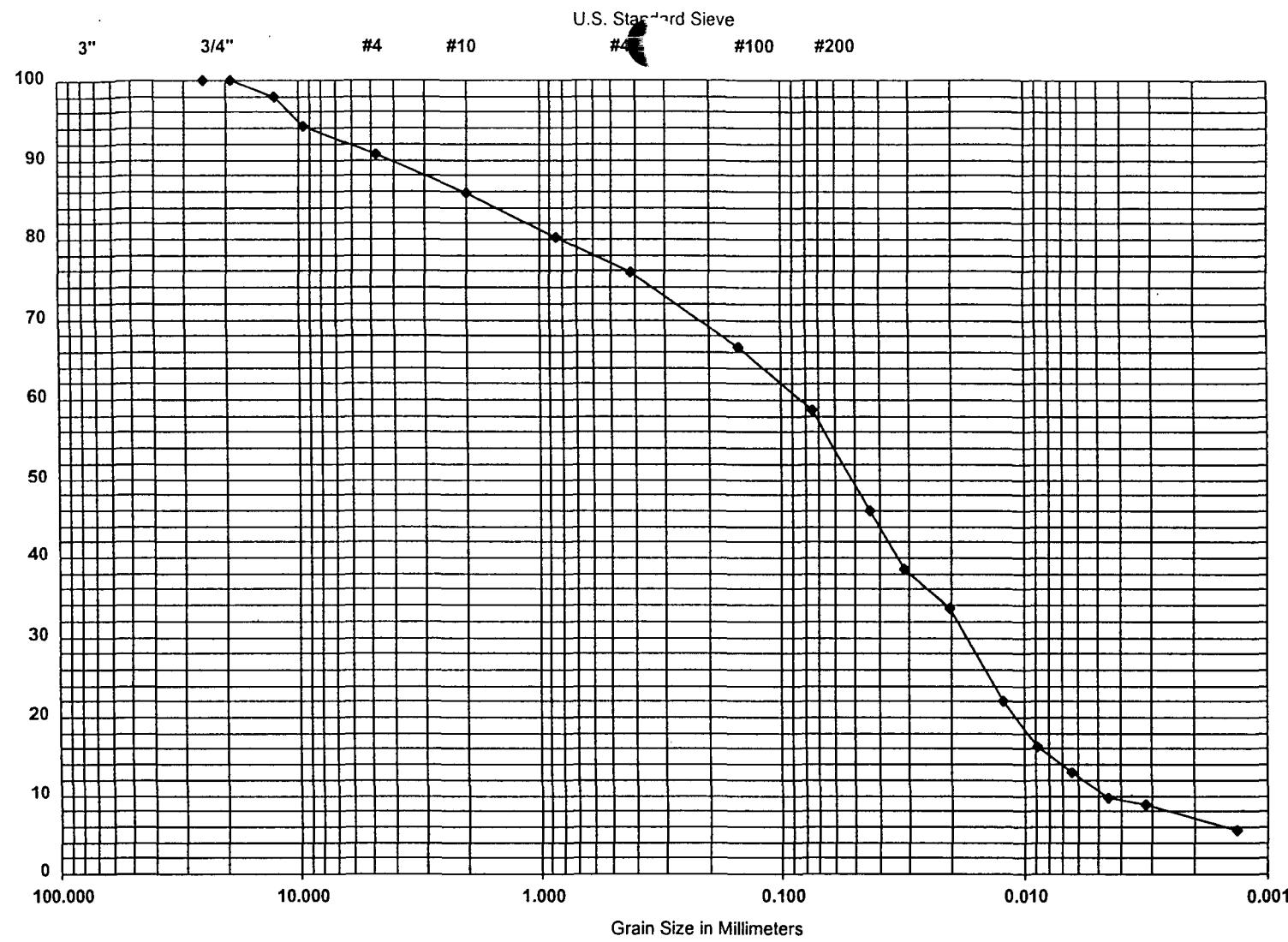
Ce: 0.8

D10: 0.0047

D30: 0.018

D60: 0.087

Unified Classification: SILT, Some Sand, Trace Gravel, ML



GRAVEL		SAND			SILT OR CLAY		
coarse	fine	coarse	medium	fine			

Boring No.: CSB-1853 Sample No.: 0 Depth: 48 LL%: PL %: PI %:
 Gravel: 9 Sand: 32 Silt: 52 Clay: 7 Cu: 18.5 Cc: 0.8 Dia10: 0.005 Dia30: 0.018 Dia60: 0.087

Unified Classification: SILT, Some Sand, Trace Gravel, ML

Project Name: Lockformer

Client: Clayton Group, Inc.

ProjectID: 73371

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3175

Project Name: Lockformer

ProjectID: 73371

Date: 12/4/2003

Boring No. CSB-1853

Sample No. 0

Depth: 52

Test No. 5

Total Sample Wt.: 252.3

	Sieve Size	Cum Wt. Ret	% Retaining	% Passing	Total Passing %	Dia (mm)
Sieve Portion.	+#10	1	0.0	100.0	100.0	25.0000
		3/4	0.0	100.0	100.0	19.0000
		1/2	8.2	96.7	96.7	12.5000
		3/8	11.8	95.3	95.3	9.5000
		No.4	22.7	91.0	91.0	4.7500
Sieve Portion.		No.10	31.5	87.5	87.5	2.0000
	-#10	No.20	2.2	95.7	83.8	0.8500
		No.40	3.8	92.6	81.0	0.4200
		No.100	9.1	82.4	72.1	0.1500
		No.200	14.7	71.4	62.5	0.0750

Wt of Sample at Start of Hydrometer : 51.3

Temperature (C): 22.5

Temp Bath Bulb Reading: 5.5

Specific Gravity: 2.70

	Elaps. Time (min)	Uncorrected	Corrected	% Passing	Total Passing %	Dia (mm)
Hydrometer Portion.	1	33.0	27.9	53.7	47.0	0.0433
	2	27.5	22.4	43.1	37.7	0.0319
	5	23.0	17.9	34.5	30.2	0.0208
	15	16.0	10.9	21.0	18.4	0.0125
	30	13.0	7.9	15.2	13.3	0.0090
	60	11.5	6.4	12.3	10.8	0.0064
	120	9.5	4.4	8.5	7.4	0.0046
	250	9.0	3.9	7.5	6.6	0.0032
	1440	8.0	2.9	5.6	4.9	0.0013

LL :

PL:

PI :

Organic : No

Gravel : 9

Sand : 29

Silt : 57

Clay : 5

Cu: 11.6

Cc:

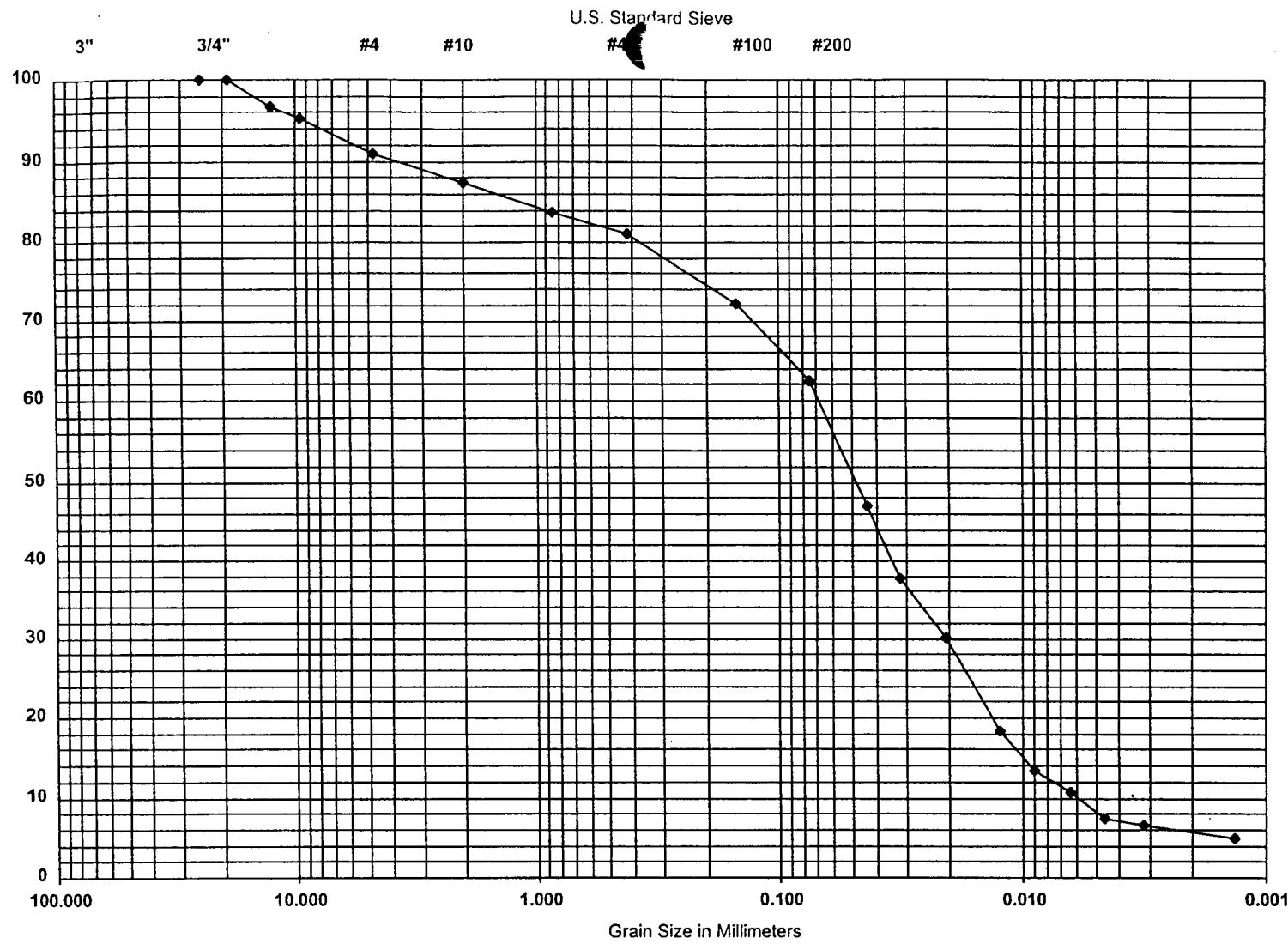
1.0

D10: 0.0060

D30: 0.021

D60: 0.07

Unified Classification: SILT, Some Sand, Trace Gravel, ML



GRAVEL		SAND			SILT OR CLAY		
coarse	fine	coarse	medium	fine			

Boring No.: CSB-1853 Sample No.: 0 Depth: 52 LL%: PL%: PI%:
 Gravel: 9 Sand: 29 Silt: 57 Clay: 5 Cu: 11.6 Cc: 1.0 Dia10: 0.006 Dia30: 0.021 Dia60: 0.070

Unified Classification: SILT, Some Sand, Trace Gravel, ML

Project Name: Lockformer

Client: Clayton Group, Inc.

ProjectID: 73371

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3167

Project Name: Lockformer

ProjectID: 73371

Date: 12/4/2003

Boring No. CSB-1854

Sample No. 0

Depth: 45.5

Test No. 3

Total Sample Wt.: 274.5

	Sieve Size	Cum Wt. Ret	% Retaining	% Passing	Total Passing %	Dia (mm)
Sieve Portion.	+#10	1	0.0	100.0	100.0	25.0000
	3/4	0.0	0.0	100.0	100.0	19.0000
	1/2	4.0	1.4	98.6	98.6	12.5000
	3/8	8.6	3.1	96.9	96.9	9.5000
	No.4	19.5	7.1	92.9	92.9	4.7500
	No.10	32.6	11.9	88.1	88.1	2.0000
Sieve Portion.	-#10	No.20	3.4	6.6	93.4	0.8500
	No.40	5.8	11.4	88.6	78.1	0.4200
	No.100	11.4	22.1	77.9	68.7	0.1500
	No.200	16.2	31.6	68.4	60.3	0.0750

Wt of Sample at Start of Hydrometer : 51.4

Temperature (C): 22.5

Temp Bath Bulb Reading: 5.5

Specific Gravity: 2.70

	Elaps. Time (min)	Uncorrected	Corrected	% Passing	Total Passing %	Dia (mm)
Hydrometer Portion.	1	33.5	28.4	54.6	48.1	0.0431
	2	28.5	23.4	45.0	39.7	0.0316
	5	25.0	19.9	38.3	33.7	0.0205
	15	17.5	12.4	23.8	21.0	0.0124
	30	15.0	9.9	19.0	16.8	0.0089
	60	12.5	7.4	14.2	12.5	0.0064
	120	10.5	5.4	10.4	9.2	0.0046
	250	10.0	4.9	9.4	8.3	0.0032
	1440	8.5	3.4	6.5	5.8	0.0013

LL :

PL:

PI :

Organic : No

Gravel : 7

Sand : 32

Silt : 54

Clay : 7

Cu: 14.8

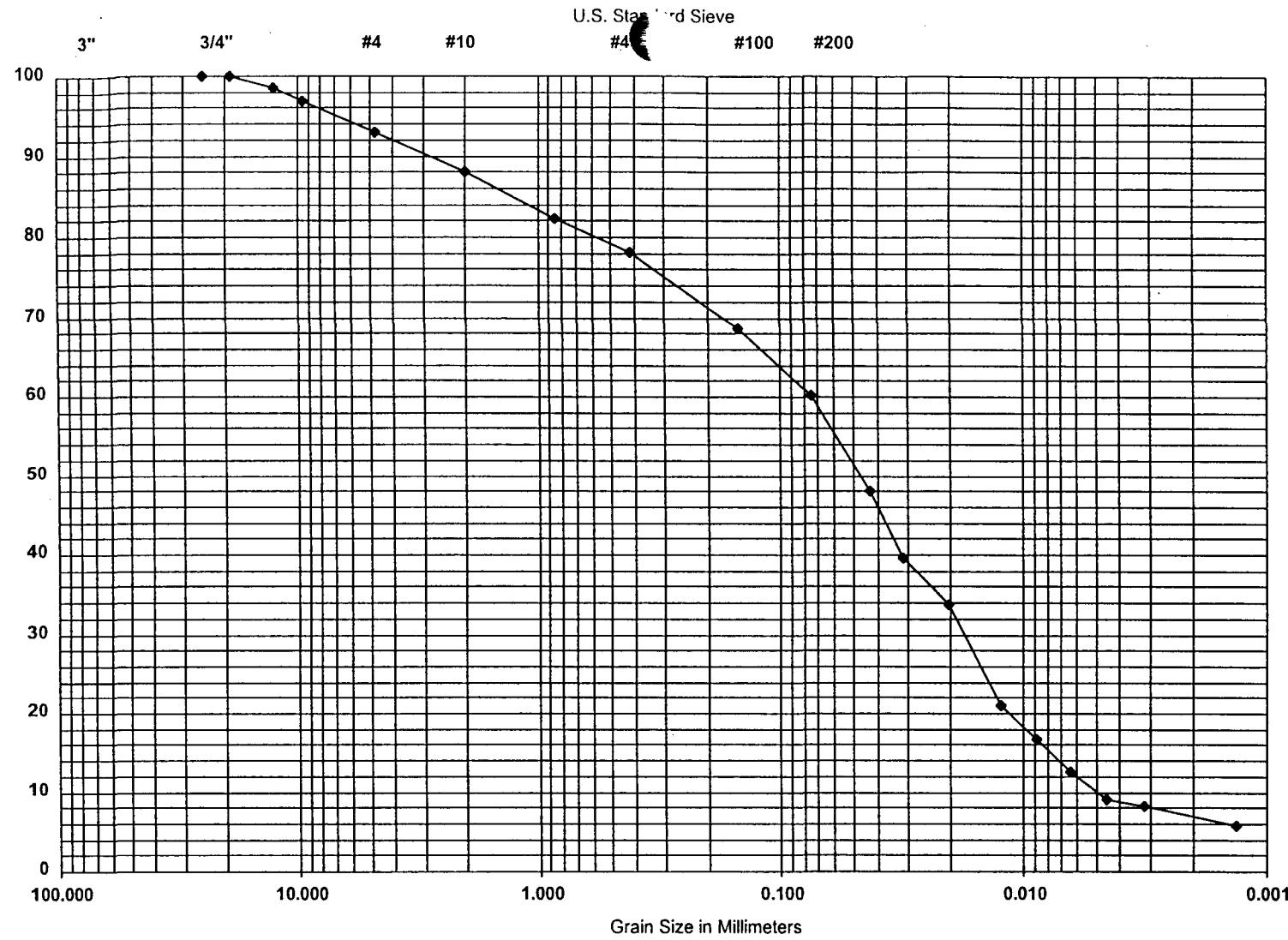
Ce: 0.9

D10: 0.0050

D30: 0.018

D60: 0.074

Unified Classification: SILT, Some Sand, Trace Gravel, ML



GRAVEL		SAND			SILT OR CLAY		
coarse	fine	coarse	medium	fine			

Boring No.: CSB-1854 Sample No.: 0 Depth: 45.5 LL%: PL%: PI%:
 Gravel: 7 Sand: 32 Silt: 54 Clay: 7 Cu: 14.8 Cc: 0.9 Dia10: 0.005 Dia30: 0.018 Dia60: 0.074

Unified Classification: SILT, Some Sand, Trace Gravel, ML

Project Name: Lockformer

Client: Clayton Group, Inc.

ProjectID: 73371

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3168

Project Name: Lockformer

ProjectID: 73371

Date: 12/4/2003

Boring No. CSB-1122A

Sample No. 0

Depth: 43.5

Test No. 4

Total Sample Wt.: 219.8

	Sieve Size	Cum Wt. Ret	% Retaining	% Passing	Total Passing %	Dia (mm)
Sieve Portion.	+#10	1	0.0	100.0	100.0	25.0000
	3/4	0.0	0.0	100.0	100.0	19.0000
	1/2	0.0	0.0	100.0	100.0	12.5000
	3/8	0.0	0.0	100.0	100.0	9.5000
	No.4	0.0	0.0	100.0	100.0	4.7500
	No.10	0.0	0.0	100.0	100.0	2.0000
Sieve Portion.	-#10	No.20	0.0	100.0	100.0	0.8500
	No.40	0.0	0.0	100.0	100.0	0.4200
	No.100	1.8	3.5	96.5	96.5	0.1500
	No.200	11.6	22.3	77.7	77.7	0.0750

Wt of Sample at Start of Hydrometer : 52.0

Temperature (C): 22.5

Temp Bath Bulb Reading: 5.5

Specific Gravity: 2.70

Hydrometer Portion.	Elaps. Time (min)	Uncorrected	Corrected	% Passing	Total Passing %	Dia (mm)
	1	34.0	28.9	55.0	55.0	0.0430
	2	25.5	20.4	38.8	38.8	0.0323
	5	18.0	12.9	24.5	24.5	0.0214
	15	12.0	6.9	13.1	13.1	0.0128
	30	9.5	4.4	8.4	8.4	0.0092
	60	7.5	2.4	4.6	4.6	0.0066
	120	7.0	1.9	3.6	3.6	0.0047
	250	6.5	1.4	2.7	2.7	0.0032
	1440	6.0	0.9	1.7	1.7	0.0014

LL :

PL:

PI :

Organic : No

Gravel :

0

Sand : 22

Silt : 76

Clay : 2

Cu: 4.8

Ce:

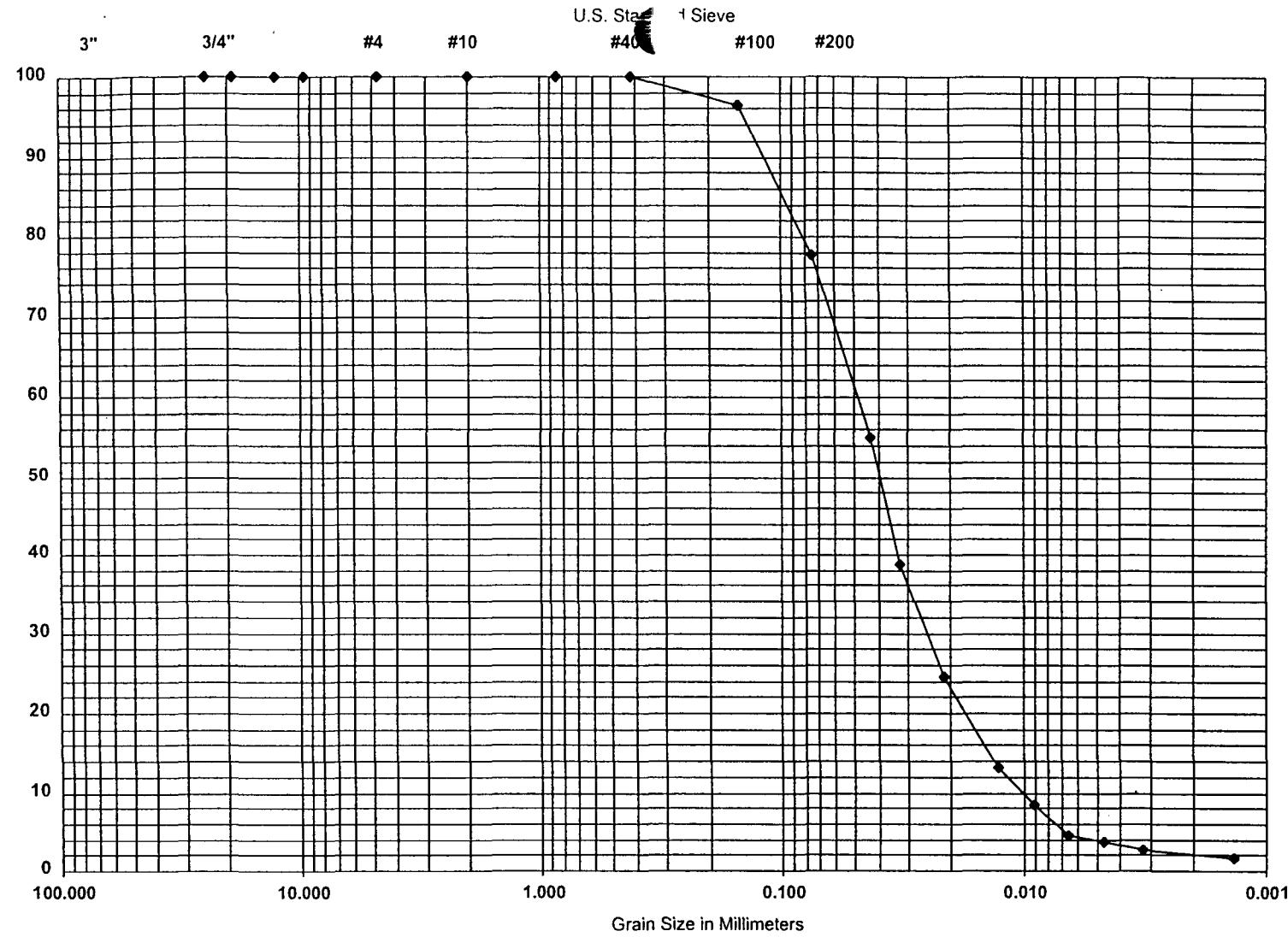
1.3

D10: 0.0104

D30: 0.026

D60: 0.050

Unified Classification: SILT, Some Sand, ML



GRAVEL		SAND			SILT OR CLAY		
coarse	fine	coarse	medium	fine			

Boring No.: CSB-1122A Sample No.: 0 Depth: 43.5 LL%: PL %: PI %:

Gravel: 0 Sand: 22 Silt: 76 Clay: 2 Cu: 4.8 Cc: 1.3 Dia10: 0.010 Dia30: 0.026 Dia60: 0.050

Unified Classification: SILT, Some Sand, ML

Project Name: Lockformer

Client: Clayton Group, Inc.

ProjectID: 73371

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3169

Project Name: Lockformer

ProjectID: 73371

Date: 12/4/2003

Boring No. CSB-1122A

Sample No. 0

Depth: 46-48

Test No. 6

Total Sample Wt.: 574.7

	Sieve Size	Cum Wt. Ret	% Retaining	% Passing	Total Passing %	Dia (mm)
Sieve Portion.	+#10	1	0.0	100.0	100.0	25.0000
	3/4	0.0	0.0	100.0	100.0	19.0000
	1/2	49.0	8.5	91.5	91.5	12.5000
	3/8	53.1	9.2	90.8	90.8	9.5000
	No.4	92.1	16.0	84.0	84.0	4.7500
	No.10	152.3	26.5	73.5	73.5	2.0000
Sieve Portion.	-#10	No.20	2.6	95.0	69.8	0.8500
	No.40	5.1	9.6	90.4	66.4	0.4200
	No.100	10.7	20.3	79.7	58.6	0.1500
	No.200	15.7	30.0	70.0	51.5	0.0750

Wt of Sample at Start of Hydrometer : 52.5

Temperature (C): 22.5

Temp Bath Bulb Reading: 5.5

Specific Gravity: 2.70

	Elaps. Time (min)	Uncorrected	Corrected	% Passing	Total Passing %	Dia (mm)
Hydrometer Portion.	1	34.0	28.9	54.4	40.0	0.0430
	2	29.5	24.4	45.9	33.8	0.0314
	5	25.5	20.4	38.4	28.2	0.0204
	15	18.5	13.4	25.2	18.5	0.0123
	30	14.5	9.4	17.7	13.0	0.0089
	60	12.0	6.9	13.0	9.5	0.0064
	120	10.5	5.4	10.2	7.5	0.0046
	250	10.0	4.9	9.2	6.8	0.0032
	1440	8.5	3.4	6.4	4.7	0.0013

LL :

PL:

PI :

Organic : No

Gravel : 16

Sand : 33

Silt : 46

Clay : 5

Cu: 29.5

Cc: 0.4

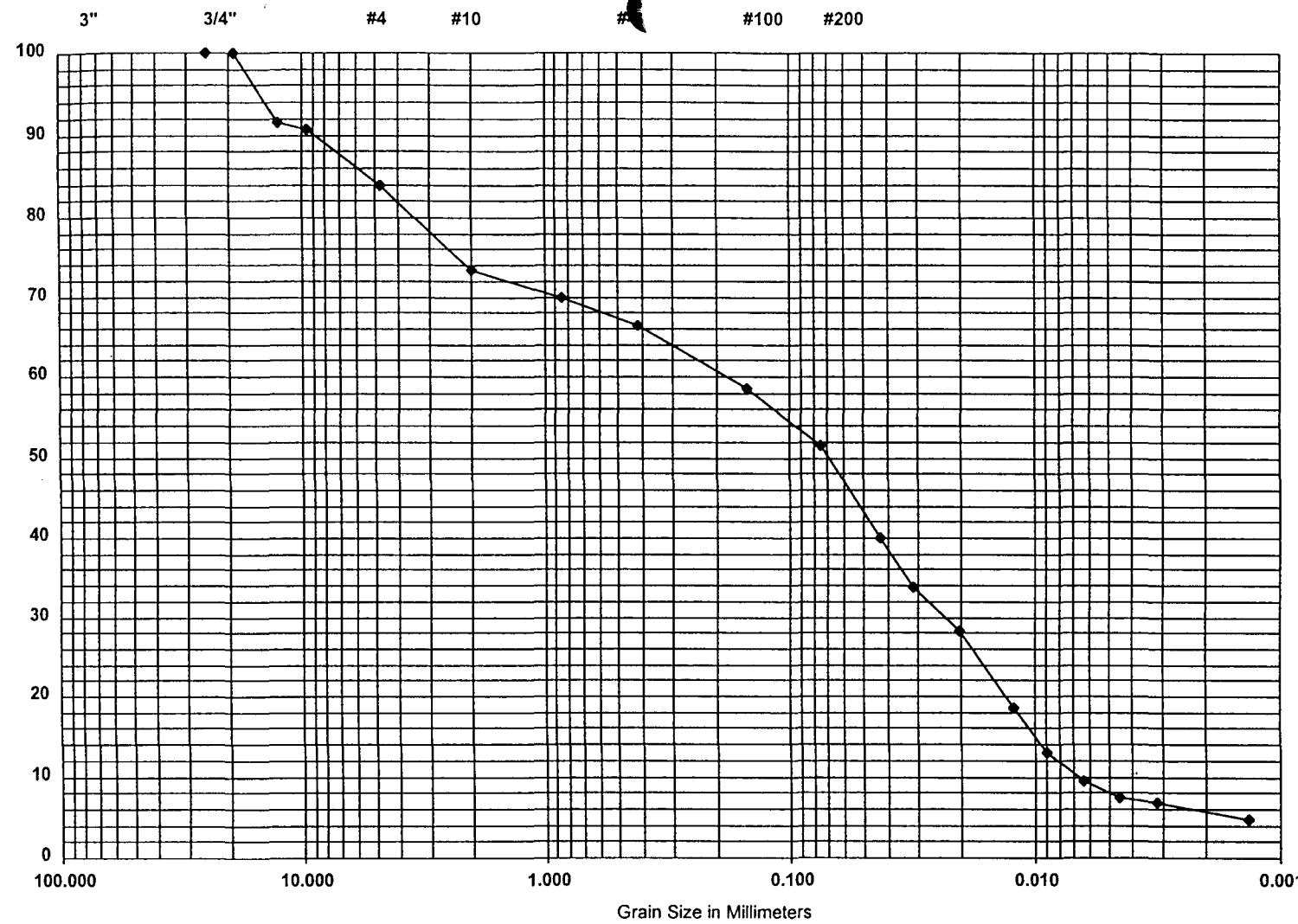
D10: 0.0067

D30: 0.024

D60: 0.199

Unified Classification: SILT, Some Sand, Little Gravel, ML

U.S. Standard Sieve



GRAVEL		SAND			SILT OR CLAY		
coarse	fine	coarse	medium	fine			

Boring No.: CSB-1122A Sample No.: 0 Depth: 46-48 LL%: PL %: PI %:
 Gravel: 16 Sand: 33 Silt: 46 Clay: 5 Cu: 29.5 Cc: 0.4 Dia10: 0.007 Dia30: 0.024 Dia60: 0.199

Unified Classification: SILT, Some Sand, Little Gravel, ML

Project Name: Lockformer

Client: Clayton Group, Inc.

ProjectID: 73371

SCHLEEDE - HAMPTON ASSOCIATES, INC.

CONSULTING ENGINEERS

1612 LANDMEIER ROAD, SUITE C, ELK GROVE VILLAGE, ILLINOIS 60007 (847) 228-1079

HYDROMETER/COMBINED ANALYSIS

TestUniqueID: 3170

Project Name: Lockformer

ProjectID: 73371

Date: 12/4/2003

Boring No. MW-1122S

Sample No. 0

Depth: 41-43

Test No. 7

Total Sample Wt.: 246.9

	Sieve Size	Cum Wt. Ret	% Retaining	% Passing	Total Passing %	Dia (mm)
+#10 Sieve Portion.	1	0.0	0.0	100.0	100.0	25.0000
	3/4	0.0	0.0	100.0	100.0	19.0000
	1/2	0.0	0.0	100.0	100.0	12.5000
	3/8	0.0	0.0	100.0	100.0	9.5000
	No.4	0.8	0.3	99.7	99.7	4.7500
-#10 Sieve Portion.	No.10	0.8	0.3	99.7	99.7	2.0000
	No.20	0.0	0.0	100.0	99.7	0.8500
	No.40	0.1	0.1	99.9	99.6	0.4200
	No.100	0.5	1.0	99.0	98.6	0.1500
	No.200	2.4	4.6	95.4	95.0	0.0750

Wt of Sample at Start of Hydrometer : 51.7

Temperature (C): 22.5

Temp Bath Bulb Reading: 5.5

Specific Gravity: 2.70

	Elaps. Time (min)	Uncorrected	Corrected	% Passing	Total Passing %	Dia (mm)
Hydrometer Portion.	1	48.0	42.9	82.1	81.9	0.0381
	2	42.5	37.4	71.6	71.4	0.0283
	5	36.0	30.9	59.2	59.0	0.0189
	15	26.0	20.9	40.0	39.9	0.0118
	30	21.5	16.4	31.4	31.3	0.0086
	60	17.5	12.4	23.7	23.7	0.0062
	120	15.5	10.4	19.9	19.8	0.0044
	250	14.0	8.9	17.0	17.0	0.0031
	1440	10.5	5.4	10.3	10.3	0.0013

LL :

PL:

PI :

Organic : No

Gravel : 0

Sand : 5

Silt : 82

Clay : 13

Cu: 15.9

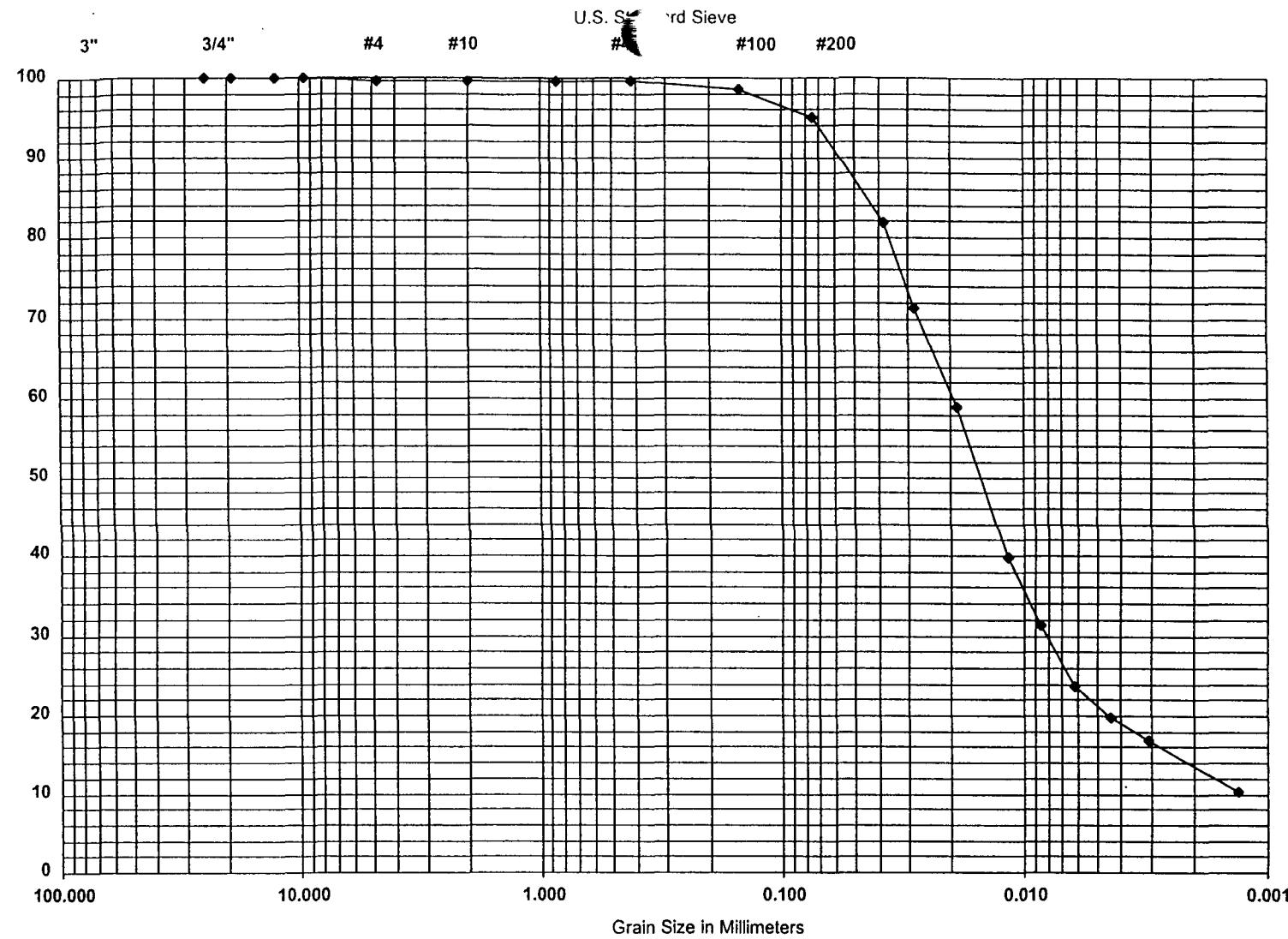
Cc: 2.7

D10: 0.0012

D30: 0.008

D60: 0.02

Unified Classification: Clayey SILT, Trace Sand, Trace Gravel, CL-ML



GRAVEL		SAND			SILT OR CLAY		
coarse	fine	coarse	medium	fine			

Boring No.: MW-1122S Sample No.: 0 Depth: 41-43 LL%: PL %: PI %:
 Gravel: 0 Sand: 5 Silt: 82 Clay: 13 Cu: 15.9 Cc: 2.7 Dia10: 0.001 Dia30: 0.008 Dia60: 0.020

Unified Classification: Clayey SILT, Trace Sand, Trace Gravel, CL-ML

Project Name: Lockformer

Client: Clayton Group, Inc.

ProjectID: 73371

COPY

Clayton PROJECT No: 65263 PROJECT TITLE: Lockformer PROJECT LOCATION/SITE: Lockformer SAMPLES CONTAIN HAZ MAT'L'S? (note 1) NO: _____ YES: <input checked="" type="checkbox"/> TYPE: U228 & F001 ASSIGNMENTS BY: _____														THIS AREA FOR SHA USE ONLY SHA FILE No: _____ DATE RECEIVED: _____ RECEIVED BY: _____									
DATE SAMPLES OBTAINED: 10/28-29/03 DATE OF LAB ASSIGNMENTS: _____ TARGET DATE/REQUIRED: 11/20/03																							
SAMPLE INFORMATION						TESTS REQUESTED (mark X in box)																	
ITEM I.D.	BORING NO.	SAMPLE NO.	TYPE SS ST or BULK	DEPTH Nominal Interval	Natural Moisture Content ASTM D 2216	Unit Weight (Bulk Density) ASTM D 2937	Unconfined Compr. Strength-Value TSF	Unconfined Compr. Strength-Split-Spoon Sample (Rimac)	Unconfined Compr. Strength-Shelby Tube (w/ S-S Curve)	Atterberg Limits (LL, PL & PI) ASTM D 4318	Dry Sieve Test 111	Combined Sieve & Hydrometer Analysis ASTM D 422	Total Organic Carbon Method EPA 9060	Total Organic Matter Method ASTM D 2974	Specific Gravity of Soil Solids (Gs) Standard ASTM D 854	Moisture Density (proctor) Modified ASTM D 698	Moisture Density (proctor) Standard ASTM D 1557	Permeability Test (Triaxial) Modified ASTM D 5084	Permeability Test (Constant Head) ASTM D 2434	Aggregate Soundness, 5-Cycle Sodium Sulfate ASTM C 88	COMMENTS OR OTHER TESTS		
1	CSB1853		BULK	38.5								X											
2	CSB1853		BULK	48								X	X	X								In case of insufficient volume, the order of priority is: D422, D2974, EPA 9060	
3	CSB1853		BULK	52								X											
4	CSB1854		BULK	45.5								X	X	X								In case of insufficient volume, the order of priority is: D422, D2974, EPA 9060	
5	CSB1122A		BULK	43.5								X											
6	CSB1122A		BULK	44									X	X	X								
7	CSB1122A		ST	46-48	X	X						X	X	X				X					
8	MW1122S		ST	41-43	X	X						X	X	X					X				
9																							
10																							
11																							
12																							
Signature										Company				Date		Time		Carrier					
Relinquished By: <i>Mark S. Chappell</i>										Clayton Group Services				11/07/03									
Received By: <i>Chilla D. B.</i>										SHA				11/7/03		12:40							
Relinquished By: <i>Mark S. Chappell</i>																							
Received By:																							
Relinquished By:																							
Received By:																							
Remarks: Haz Materials may include low concentrations (<3 mg/kg) or chlorinated solvents, primarily trichloroethylene.																							

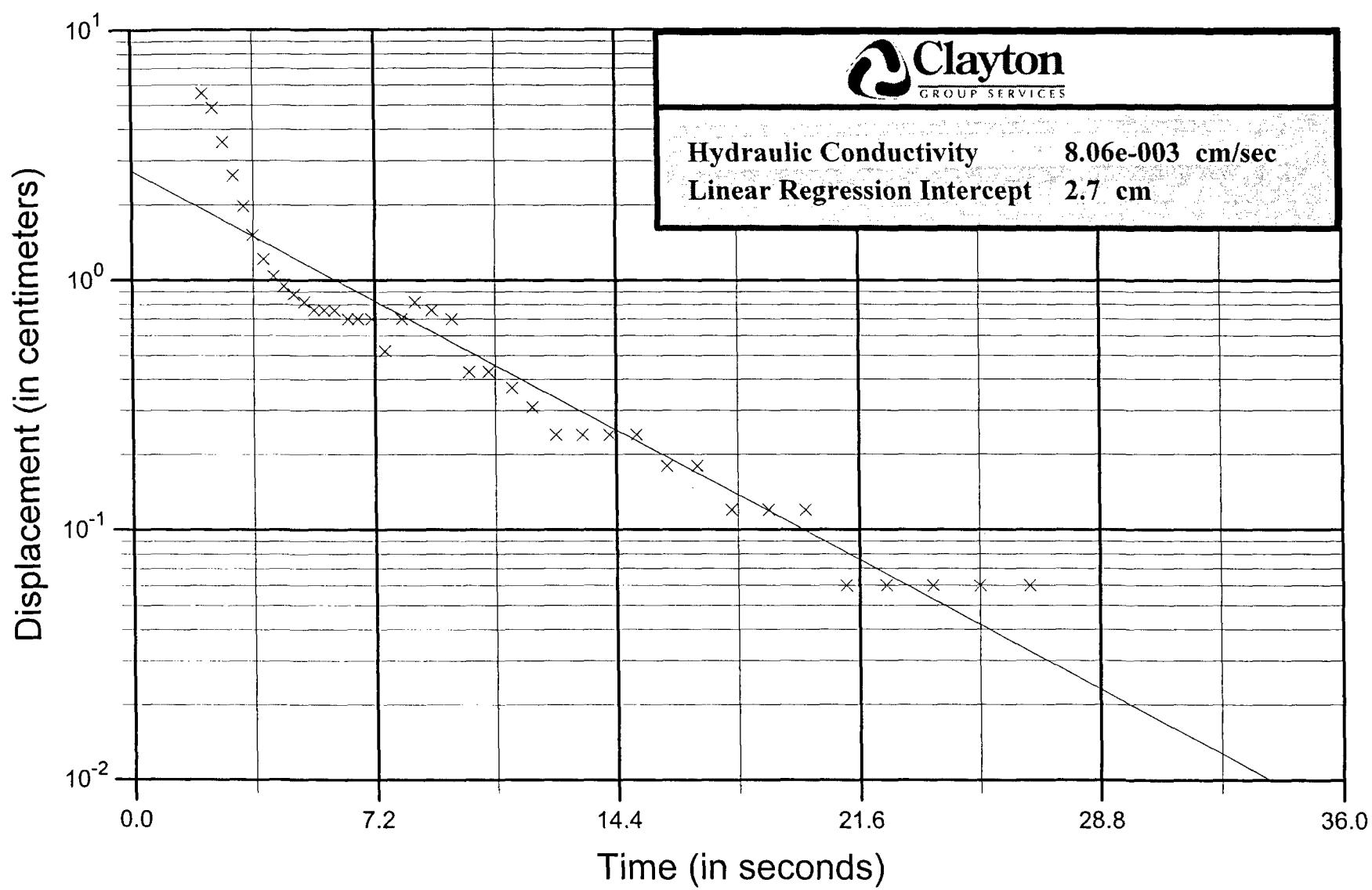
Note 1: If suspected, describe possible Haz Materials; samples requiring special handling or precautions, subject to additional processing fees.
 Note 2: If checked, each sample will be tested for: Nat. Moisture Cont., Bulk Density and Gs; then WVR will be calculated.

Form Lab 101.4 Rev. 9/97 ©SHA 1990

APPENDIX C

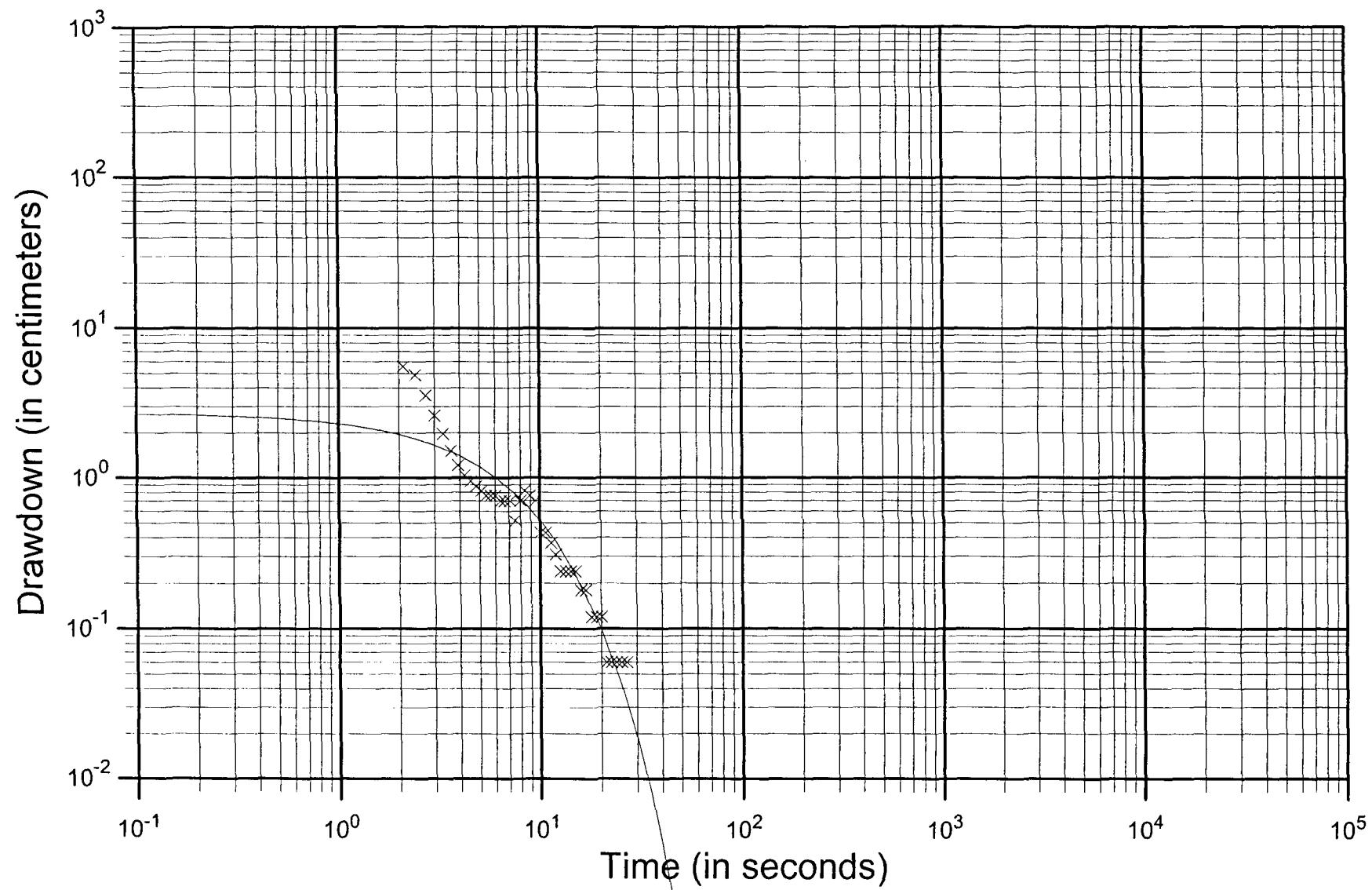
SLUG TEST DATA

MW521 Falling Head Slug Test

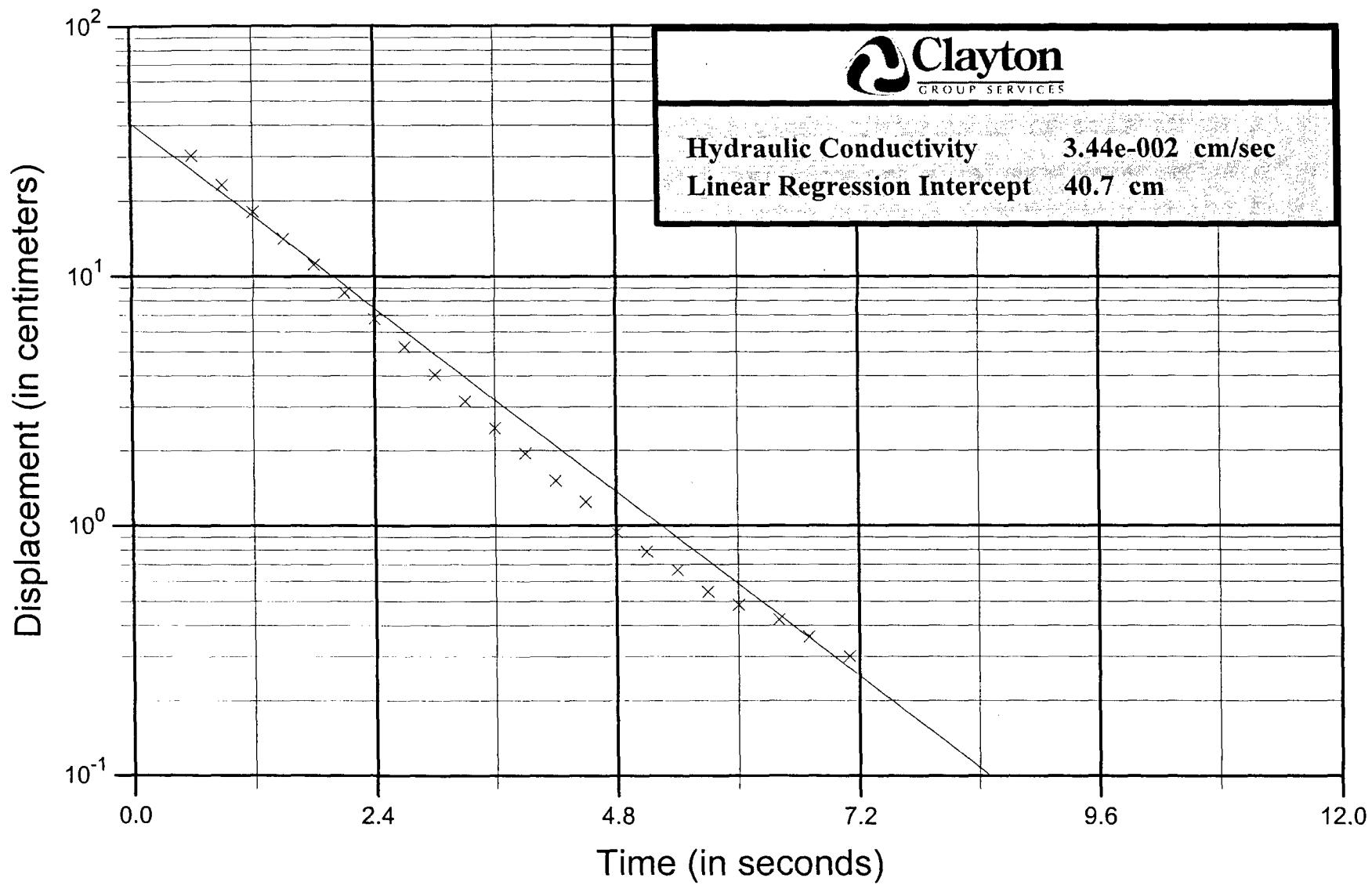


Bouwer and Rice Method (1976)

MW521 FH (Plot vs. Predicted Curve)

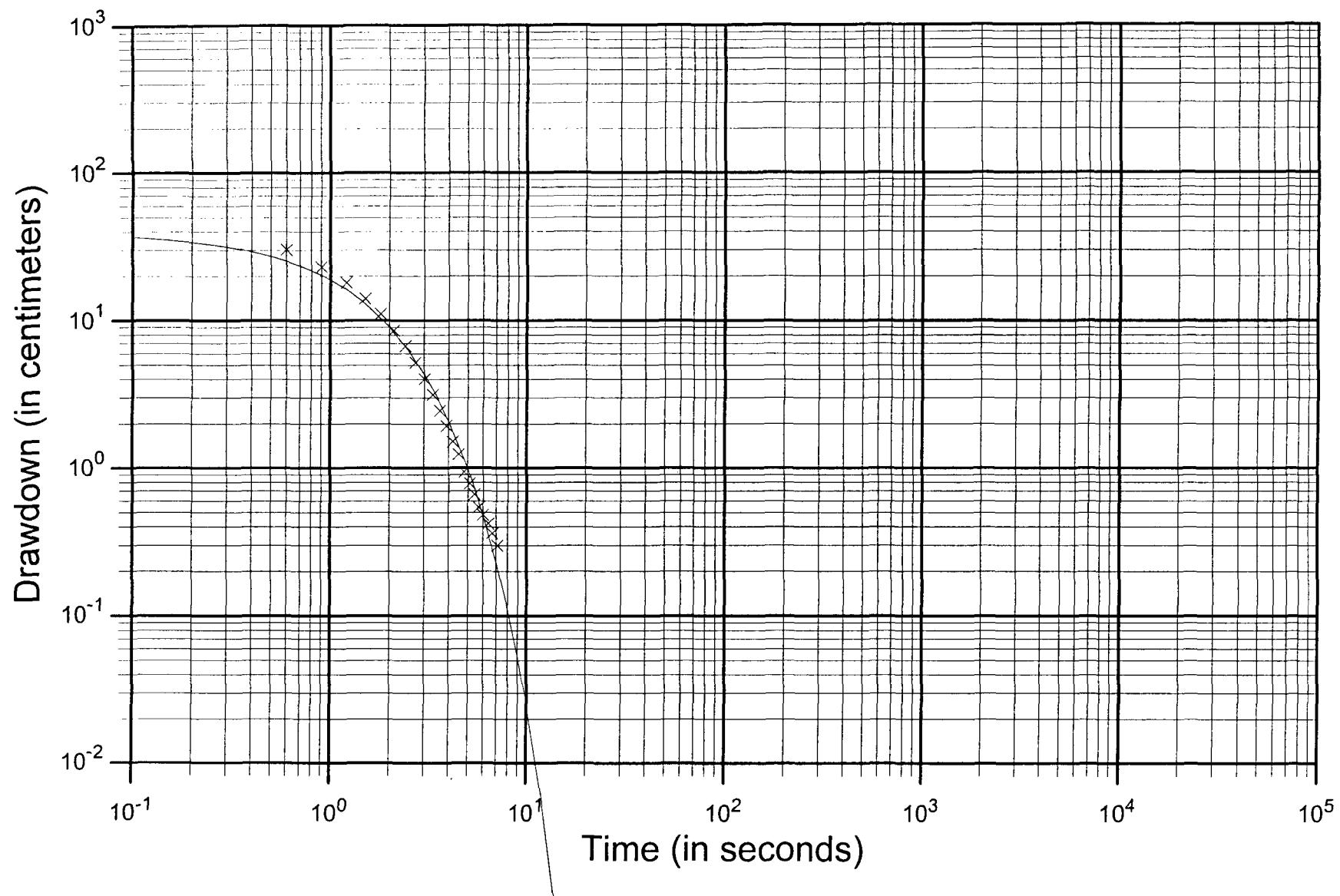


MW521 Rising Head Slug Test

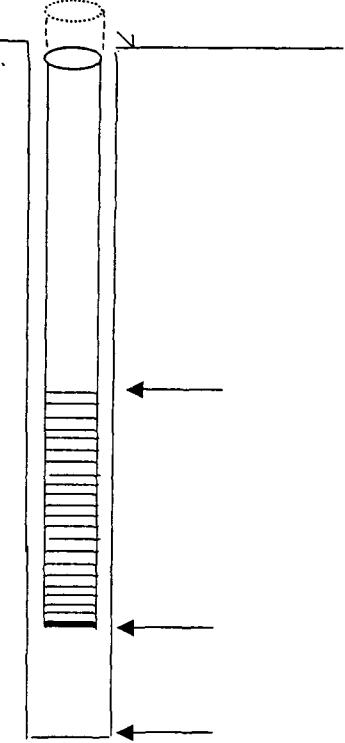


Bouwer and Rice Method (1976)

MW521 RH (Plot vs. Predicted Curve)



SLUG TEST DATA FORM

PROJECT INFORMATION						
Project Name	Lockformer			Well ID	MW-521	
Project No.	15-65263.10-001			Test Date	5/29/2004	
Field Personnel	D. Lamsma, K. Woloszyn			Unconfined		
EQUIPMENT INFORMATION					ILLUSTRATION OF INFORMATION	
Data Logger Type / Model No.	In-Situ					
Transducer Type / Model No.	Minitroll #5914					
Slug Length / Volume	3 feet / 0.28 gallons					
GENERAL INFORMATION						
Static Groundwater Elevation	656.44	ft MSL				
Ground Surface Elevation	705.9	ft MSL				
Top of Casing Elevation	709.11	ft MSL				
Well Stick-up	3.21	ft	97.8	cm		
Depth to Water	52.67	ft	1605.4	cm		
Diameter of Well Casing	2	in	5.1	cm		
Diameter of Borehole at Screen	6	in	15.2	cm		
Screen Interval	50.0 - 60.0	ft BG	1524 - 1829	cm BG		
Screen Length	10	ft	304.8	cm		
Base of Boring	60	ft BG	1828.8	cm BG		
Base of Upper Confining Unit	---	ft BG	0.0	cm BG		
Top of Lower Confining Unit	---	ft BG	0.0	cm BG		
Saturated Thickness (b)	10.66	ft	324.9	cm		
Static Height of Water in Well	10.66	ft	324.9	cm		
Geology of Aquifer	Sand					
SLUG TEST MEASUREMENT INFORMATION						
Parameter	Falling Head			Rising Head		
Initial Water Level Above Transducer	9	ft	274.32	cm	9	ft
Initial Drawdown/Recovery	0.18	ft	5.61	cm	0.97	ft
SLUG TEST RESULTS						
Falling H	Rising H	Analysis Method		Parameter	Calculated Value and Units	
Notes:						

SLUG TEST DATA FORM

PROJECT INFORMATION						
Project Name	Lockformer			Well ID	MW-521	
Project No.	15-65263.10-001			Test Date	5/29/2004	
Field Personnel	D. Lamsma, K. Woloszyn					
EQUIPMENT INFORMATION					ILLUSTRATION OF INFORMATION	
Data Logger Type / Model No.	In-Situ					
Transducer Type / Model No.	Minitroll #5914					
Slug Length / Volume	3 feet / 0.28 gallons					
GENERAL INFORMATION						
Static Groundwater Elevation	656.44	ft MSL				
Ground Surface Elevation	705.9	ft MSL				
Top of Casing Elevation	709.11	ft MSL				
Well Stick-up	3.21	ft	97.8	cm		
Depth to Water	52.67	ft	1605.4	cm		
Diameter of Well Casing	2	in	5.1	cm		
Diameter of Borehole at Screen	6	in	15.2	cm		
Screen Interval	50.0 - 60.0	ft BG	1524 - 1829	cm BG		
Screen Length	10	ft	304.8	cm		
Base of Boring	60	ft BG	1828.8	cm BG		
Base of Upper Confining Unit	---	ft BG	0.0	cm BG		
Top of Lower Confining Unit	---	ft BG	0.0	cm BG		
Saturated Thickness (b)	10.66	ft	324.9	cm		
Static Height of Water in Well	10.66	ft	324.9	cm		
Geology of Aquifer	Sand					
SLUG TEST MEASUREMENT INFORMATION						
Parameter	Falling Head			Rising Head		
Initial Water Level Above Transducer	9	ft	274.32	cm	9	ft
Initial Drawdown/Recovery	0.18	ft	5.61	cm	0.97	ft
SLUG TEST RESULTS						
Falling H	Rising H	Analysis Method		Parameter	Calculated Value and Units	
Notes:						

In-Situ Inc. MiniTroll Pro

Report generated: 5/30/2003 13:58:53
 Report from file: ...\\SN05914 2003-05-30 111008 MW521 FH.bin
 Win-Situ Version 4.41

Serial number: 5914
 Firmware Version 3.07
 Unit name: MiniTROLL

Test name: MW521 FH

Test defined on: 5/30/2003 11:09:42
 Test started on: 5/30/2003 11:10:08
 Test stopped on: 5/30/2003 11:12:07
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing
 Maximum time between data points: 600.0 Seconds.
 Number of data samples: 73

TOTAL DATA SAMPLES 73

Channel number [1]
 Measurement type: Temperature
 Channel name: Temperature

Values oscillate, are negative, and there is
 not much displacement

Channel number [2]
 Measurement type: Pressure
 Channel name: Pressure
 Sensor Range: 30 PSIG.
 Specific gravity: 1
 Mode: Surface
 User-defined reference: 0 Feet H2O
 Referenced on: test start
 Pressure head at reference: 7.067 Feet H2O

Slug Size: 3 ft x 1.5 in
Depth to water (bgs)=52.42'
Screen length (amount exposed to aquifer)=7.58'
Aquifer thickness=7.58'
Top of screen (water above screen)=0'

Date	Time	ET (sec)	Chan[1]	Chan[2]	Time (sec)	Head (cm)
			Fahrenheit	Feet H2O		
5/30/2003	11:10:08	0	53.82	0	-2.1	0.00
5/30/2003	11:10:08	0.3	53.84	-0.195	-1.8	-5.94
5/30/2003	11:10:08	0.6	53.87	0.661	-1.5	20.15
5/30/2003	11:10:08	0.9	53.87	-0.193	-1.2	-5.88
5/30/2003	11:10:09	1.2	53.87	0.122	-0.9	3.72
5/30/2003	11:10:09	1.5	53.87	-1.704	-0.6	-51.94

Date	Time	ET (sec)	Chan[1]	Chan[2]	Time (sec)	Head (cm)
			Fahrenheit	Feet H2O		
5/30/2003	11:10:09	1.8	53.87	-0.772	-0.3	-23.53
5/30/2003	11:10:10	2.1	53.87	-0.649	0.0	-19.78
5/30/2003	11:10:10	2.4	53.87	-0.672	0.3	-20.48
5/30/2003	11:10:10	2.7	53.89	-0.715	0.6	-21.79
5/30/2003	11:10:11	3	53.89	-0.746	0.9	-22.74
5/30/2003	11:10:11	3.3	53.89	-0.767	1.2	-23.38
5/30/2003	11:10:11	3.6	53.89	-0.782	1.5	-23.84
5/30/2003	11:10:11	3.9	53.89	-0.792	1.8	-24.14
5/30/2003	11:10:12	4.2	53.89	-0.798	2.1	-24.32
5/30/2003	11:10:12	4.5	53.89	-0.801	2.4	-24.41
5/30/2003	11:10:12	4.8	53.89	-0.803	2.7	-24.48
5/30/2003	11:10:13	5.1	53.89	-0.805	3.0	-24.54
5/30/2003	11:10:13	5.4	53.89	-0.807	3.3	-24.60
5/30/2003	11:10:13	5.7	53.89	-0.807	3.6	-24.60
5/30/2003	11:10:14	6	53.89	-0.807	3.9	-24.60
5/30/2003	11:10:14	6.4	53.89	-0.809	4.3	-24.66
5/30/2003	11:10:14	6.7	53.89	-0.809	4.6	-24.66
5/30/2003	11:10:15	7.1	53.89	-0.809	5.0	-24.66
5/30/2003	11:10:15	7.5	53.89	-0.815	5.4	-24.84
5/30/2003	11:10:16	8	53.89	-0.809	5.9	-24.66
5/30/2003	11:10:16	8.4	53.89	-0.805	6.3	-24.54
5/30/2003	11:10:17	8.9	53.89	-0.807	6.8	-24.60
5/30/2003	11:10:17	9.5	53.89	-0.809	7.4	-24.66
5/30/2003	11:10:18	10	53.87	-0.818	7.9	-24.93
5/30/2003	11:10:18	10.6	53.87	-0.818	8.5	-24.93
5/30/2003	11:10:19	11.3	53.87	-0.82	9.2	-24.99
5/30/2003	11:10:20	11.9	53.87	-0.822	9.8	-25.05
5/30/2003	11:10:20	12.6	53.87	-0.824	10.5	-25.12
5/30/2003	11:10:21	13.4	53.87	-0.824	11.3	-25.12
5/30/2003	11:10:22	14.2	53.87	-0.824	12.1	-25.12
5/30/2003	11:10:23	15	53.87	-0.824	12.9	-25.12
5/30/2003	11:10:23	15.9	53.87	-0.826	13.8	-25.18
5/30/2003	11:10:24	16.8	53.87	-0.826	14.7	-25.18
5/30/2003	11:10:25	17.8	53.87	-0.828	15.7	-25.24
5/30/2003	11:10:26	18.9	53.87	-0.828	16.8	-25.24
5/30/2003	11:10:28	20	53.84	-0.828	17.9	-25.24
5/30/2003	11:10:29	21.2	53.84	-0.83	19.1	-25.30
5/30/2003	11:10:30	22.4	53.87	-0.83	20.3	-25.30
5/30/2003	11:10:31	23.8	53.84	-0.83	21.7	-25.30
5/30/2003	11:10:33	25.2	53.87	-0.83	23.1	-25.30
5/30/2003	11:10:34	26.7	53.84	-0.83	24.6	-25.30
5/30/2003	11:10:36	28.2	53.84	-0.832	26.1	-25.36
5/30/2003	11:10:37	29.8	53.84	-0.832	27.7	-25.36
5/30/2003	11:10:39	31.5	53.84	-0.832	29.4	-25.36
5/30/2003	11:10:41	33.3	53.84	-0.832	31.2	-25.36
5/30/2003	11:10:43	35.2	53.84	-0.832	33.1	-25.36
5/30/2003	11:10:45	37.3	53.84	-0.834	35.2	-25.42
5/30/2003	11:10:47	39.5	53.84	-0.832	37.4	-25.36
5/30/2003	11:10:49	41.8	53.84	-0.832	39.7	-25.36

Date	Time	ET (sec)	Chan[1]		Chan[2]	
			Fahrenheit	Feet H2O	Time (sec)	Head (cm)
5/30/2003	11:10:52	44.3	53.84	-0.832	42.2	-25.36
5/30/2003	11:10:54	46.9	53.84	-0.834	44.8	-25.42
5/30/2003	11:10:57	49.7	53.84	-0.832	47.6	-25.36
5/30/2003	11:11:00	52.6	53.84	-0.834	50.5	-25.42
5/30/2003	11:11:03	55.7	53.84	-0.834	53.6	-25.42
5/30/2003	11:11:07	59	53.82	-0.831	56.9	-25.33
5/30/2003	11:11:10	62.5	53.82	-0.831	60.4	-25.33
5/30/2003	11:11:14	66.2	53.82	-0.831	64.1	-25.33
5/30/2003	11:11:18	70.1	53.82	-0.831	68.0	-25.33
5/30/2003	11:11:22	74.3	53.82	-0.833	72.2	-25.39
5/30/2003	11:11:26	78.7	53.82	-0.833	76.6	-25.39
5/30/2003	11:11:31	83.4	53.82	-0.833	81.3	-25.39
5/30/2003	11:11:36	88.4	53.8	-0.833	86.3	-25.39
5/30/2003	11:11:41	93.7	53.8	-0.833	91.6	-25.39
5/30/2003	11:11:47	99.3	53.8	-0.833	97.2	-25.39
5/30/2003	11:11:53	105.2	53.8	-0.833	103.1	-25.39
5/30/2003	11:11:59	111.5	53.8	-0.833	109.4	-25.39
5/30/2003	11:12:06	118.1	53.8	-0.833	116.0	-25.39

2.1	5.58
2.4	4.88
2.7	3.57
3	2.62
3.3	1.98
3.6	1.52
3.9	1.22
4.2	1.04
4.5	0.95
4.8	0.88
5.1	0.82
5.4	0.76
5.7	0.76
6	0.76
6.4	0.70
6.7	0.70
7.1	0.70
7.5	0.52
8	0.70
8.4	0.82
8.9	0.76
9.5	0.70
10	0.43
10.6	0.43
11.3	0.37
11.9	0.31
12.6	0.24
13.4	0.24
14.2	0.24
15	0.24
15.9	0.18
16.8	0.18
17.8	0.12
18.9	0.12
20	0.12
21.2	0.06
22.4	0.06
23.8	0.06
25.2	0.06
26.7	0.06
28.2	0.00
29.8	0.00
31.5	0.00
33.3	0.00
35.2	0.00

In-Situ Inc. MiniTroll Pro
 Report generated: 5/30/2003 13:59:51
 Report from file: ...\\SN05914 2003-05-30 111347 MW521 RH.bin
 Win-Situ Version 4.41
 Serial number: 5914
 Firmware Version 3.07
 Unit name: MiniTROLL
 Test name: MW521 RH
 Test defined on: 5/30/2003 11:13:26
 Test started on: 5/30/2003 11:13:47
 Test stopped on: 5/30/2003 11:16:48
 Test extracted on: N/A N/A
 Data gathered using Logarithmic testing
 Maximum time between data points: 600.0 Seconds.
 Number of data samples: 80
 TOTAL DATA SAMPLES 80
 Channel number [1]
 Measurement type: Temperature
 Channel name: Temperature
 Channel number [2]
 Measurement type: Pressure
 Channel name: Pressure
 Sensor Range: 30 PSIG.
 Specific gravity: 1
 Mode: TOC
 User-defined reference: 0 Feet H2O
 Referenced on: test start
 Pressure head at reference: 5.216 Feet H2O

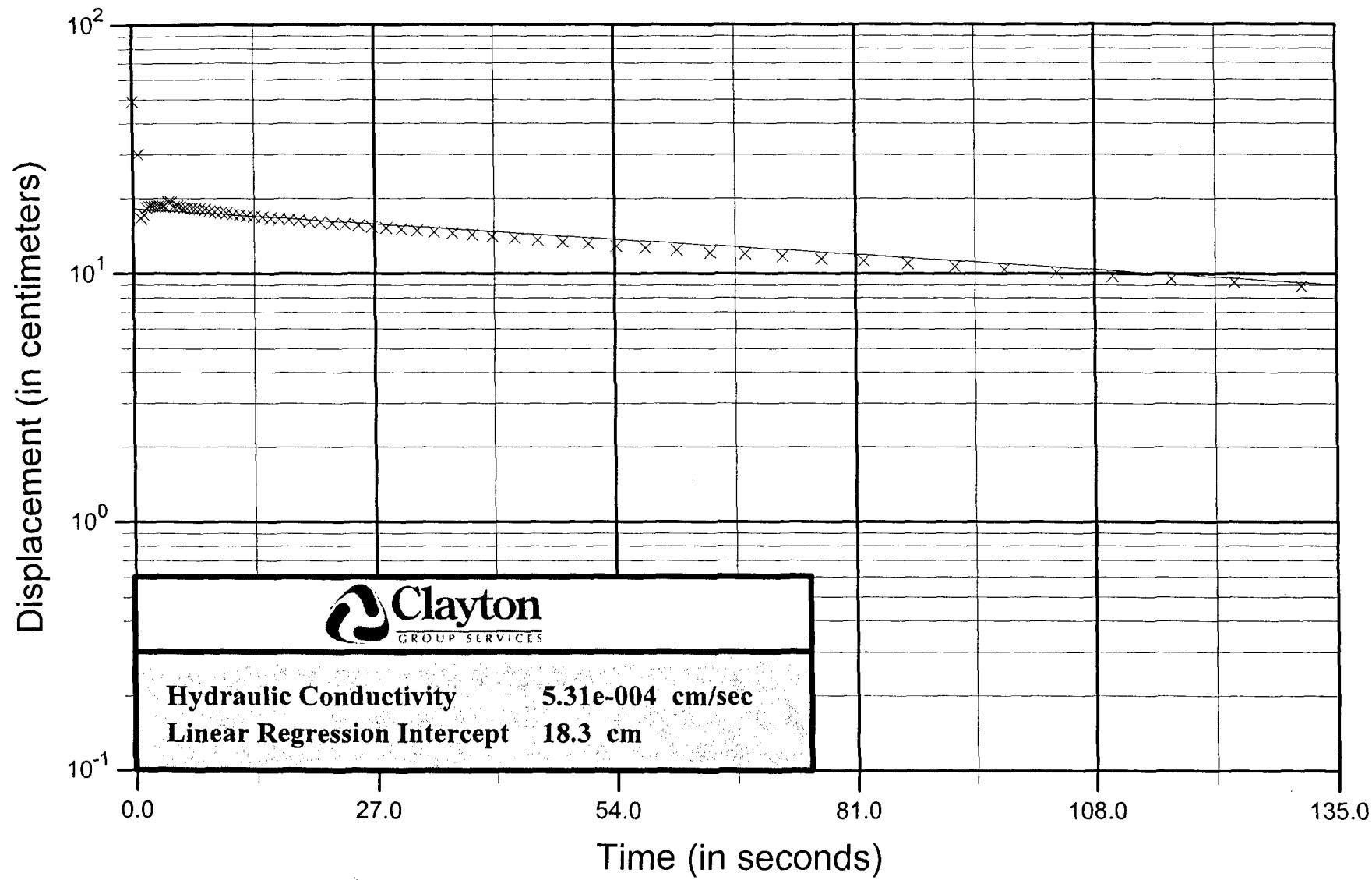
Values oscillate, are negative, and there is not much displacement

Date	Time	ET (sec)	Chan[1] Farenheit	Chan[2] Feet H2O	Time (sec)	Head (cm)
5/30/2003	11:13:47	0	53.73	0	-0.6	0
5/30/2003	11:13:47	0.3	53.78	-0.679	-0.3	-20.6959
5/30/2003	11:13:47	0.6	53.78	-0.055	0	-1.6764
5/30/2003	11:13:48	0.9	53.78	-0.288	0.3	-8.77824
5/30/2003	11:13:48	1.2	53.78	-0.455	0.6	-13.8684
5/30/2003	11:13:48	1.5	53.8	-0.586	0.9	-17.8613

Date	Time	ET (sec)	Chan[1]		Chan[2]	
			Fahrenheit	Feet H2O	Time (sec)	Head (cm)
5/30/2003	11:13:49	1.8	53.8	-0.684	1.2	-20.8483
5/30/2003	11:13:49	2.1	53.8	-0.767	1.5	-23.3782
5/30/2003	11:13:49	2.4	53.8	-0.828	1.8	-25.2374
5/30/2003	11:13:49	2.7	53.8	-0.878	2.1	-26.7614
5/30/2003	11:13:50	3	53.8	-0.917	2.4	-27.9502
5/30/2003	11:13:50	3.3	53.8	-0.946	2.7	-28.8341
5/30/2003	11:13:50	3.6	53.8	-0.969	3	-29.5351
5/30/2003	11:13:51	3.9	53.8	-0.986	3.3	-30.0533
5/30/2003	11:13:51	4.2	53.8	-1	3.6	-30.48
5/30/2003	11:13:51	4.5	53.8	-1.009	3.9	-30.7543
5/30/2003	11:13:52	4.8	53.8	-1.019	4.2	-31.0591
5/30/2003	11:13:52	5.1	53.82	-1.024	4.5	-31.2115
5/30/2003	11:13:52	5.4	53.82	-1.028	4.8	-31.3334
5/30/2003	11:13:52	5.7	53.82	-1.032	5.1	-31.4554
5/30/2003	11:13:53	6	53.82	-1.034	5.4	-31.5163
5/30/2003	11:13:53	6.4	53.82	-1.036	5.8	-31.5773
5/30/2003	11:13:53	6.7	53.82	-1.038	6.1	-31.6382
5/30/2003	11:13:54	7.1	53.82	-1.04	6.5	-31.6992
5/30/2003	11:13:54	7.5	53.82	-1.038	6.9	-31.6382
5/30/2003	11:13:55	8	53.82	-1.04	7.4	-31.6992
5/30/2003	11:13:55	8.4	53.82	-1.04	7.8	-31.6992
5/30/2003	11:13:56	8.9	53.82	-1.04	8.3	-31.6992
5/30/2003	11:13:56	9.5	53.82	-1.04	8.9	-31.6992
5/30/2003	11:13:57	10	53.8	-1.032	9.4	-31.4554
5/30/2003	11:13:57	10.6	53.8	-1.03	10	-31.3944
5/30/2003	11:13:58	11.3	53.8	-1.029	10.7	-31.3639
5/30/2003	11:13:59	11.9	53.8	-1.029	11.3	-31.3639
5/30/2003	11:13:59	12.6	53.8	-1.027	12	-31.303
5/30/2003	11:14:00	13.4	53.8	-1.027	12.8	-31.303
5/30/2003	11:14:01	14.2	53.78	-1.025	13.6	-31.242
5/30/2003	11:14:02	15	53.78	-1.025	14.4	-31.242
5/30/2003	11:14:03	15.9	53.78	-1.023	15.3	-31.181
5/30/2003	11:14:04	16.8	53.78	-1.025	16.2	-31.242
5/30/2003	11:14:05	17.8	53.8	-1.023	17.2	-31.181
5/30/2003	11:14:06	18.9	53.78	-1.021	18.3	-31.1201
5/30/2003	11:14:07	20	53.78	-1.023	19.4	-31.181
5/30/2003	11:14:08	21.2	53.8	-1.021	20.6	-31.1201
5/30/2003	11:14:09	22.4	53.78	-1.021	21.8	-31.1201
5/30/2003	11:14:11	23.8	53.78	-1.021	23.2	-31.1201
5/30/2003	11:14:12	25.2	53.78	-1.021	24.6	-31.1201
5/30/2003	11:14:13	26.7	53.78	-1.021	26.1	-31.1201
5/30/2003	11:14:15	28.2	53.78	-1.021	27.6	-31.1201
5/30/2003	11:14:17	29.8	53.78	-1.021	29.2	-31.1201
5/30/2003	11:14:18	31.5	53.78	-1.019	30.9	-31.0591
5/30/2003	11:14:20	33.3	53.78	-1.021	32.7	-31.1201
5/30/2003	11:14:22	35.2	53.78	-1.019	34.6	-31.0591
5/30/2003	11:14:24	37.3	53.78	-1.019	36.7	-31.0591
5/30/2003	11:14:26	39.5	53.78	-1.019	38.9	-31.0591
5/30/2003	11:14:29	41.8	53.78	-1.019	41.2	-31.0591

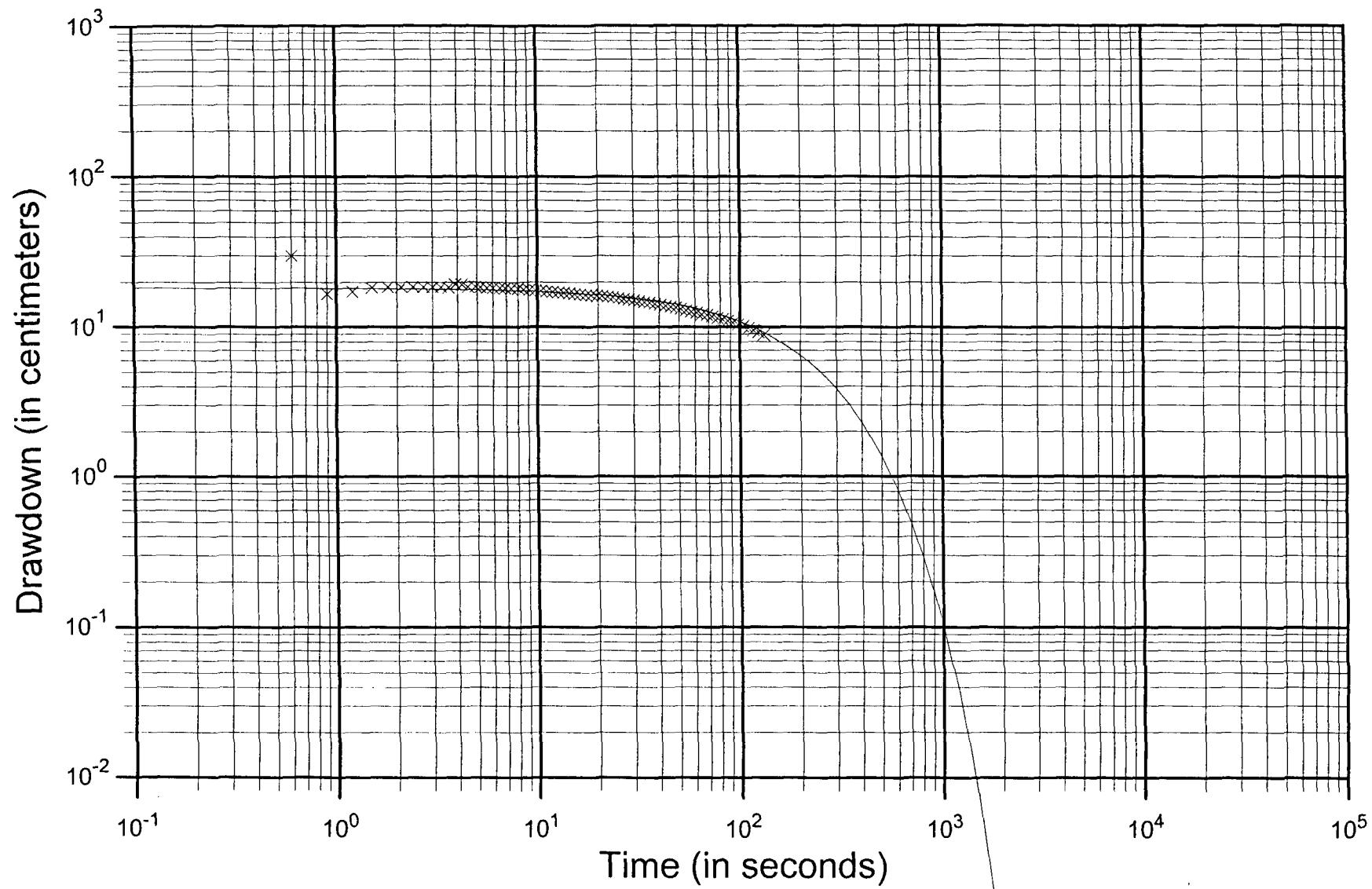
Date	Time	ET (sec)	Chan[1]		Chan[2]		Head (cm)
			Fahrenheit	Feet H2O	Time (sec)		
5/30/2003	11:14:31	44.3	53.78	-1.019	43.7	-31.0591	
5/30/2003	11:14:34	46.9	53.78	-1.019	46.3	-31.0591	
5/30/2003	11:14:36	49.7	53.78	-1.019	49.1	-31.0591	
5/30/2003	11:14:39	52.6	53.78	-1.019	52	-31.0591	
5/30/2003	11:14:42	55.7	53.78	-1.019	55.1	-31.0591	
5/30/2003	11:14:46	59	53.75	-1.018	58.4	-31.0286	
5/30/2003	11:14:49	62.5	53.78	-1.019	61.9	-31.0591	
5/30/2003	11:14:53	66.2	53.78	-1.019	65.6	-31.0591	
5/30/2003	11:14:57	70.1	53.78	-1.019	69.5	-31.0591	
5/30/2003	11:15:01	74.3	53.75	-1.02	73.7	-31.0896	
5/30/2003	11:15:05	78.7	53.75	-1.02	78.1	-31.0896	
5/30/2003	11:15:10	83.4	53.75	-1.018	82.8	-31.0286	
5/30/2003	11:15:15	88.4	53.75	-1.018	87.8	-31.0286	
5/30/2003	11:15:20	93.7	53.75	-1.02	93.1	-31.0896	
5/30/2003	11:15:26	99.3	53.75	-1.02	98.7	-31.0896	
5/30/2003	11:15:32	105.2	53.75	-1.02	104.6	-31.0896	
5/30/2003	11:15:38	111.5	53.75	-1.02	110.9	-31.0896	
5/30/2003	11:15:45	118.1	53.75	-1.02	117.5	-31.0896	
5/30/2003	11:15:52	125.1	53.75	-1.02	124.5	-31.0896	
5/30/2003	11:15:59	132.6	53.75	-1.02	132	-31.0896	
5/30/2003	11:16:07	140.5	53.73	-1.02	139.9	-31.0896	
5/30/2003	11:16:16	148.9	53.73	-1.02	148.3	-31.0896	
5/30/2003	11:16:25	157.8	53.73	-1.02	157.2	-31.0896	
5/30/2003	11:16:34	167.2	53.73	-1.022	166.6	-31.1506	
5/30/2003	11:16:44	177.2	53.73	-1.022	176.6	-31.1506	

MW1100S Falling Head Slug Test

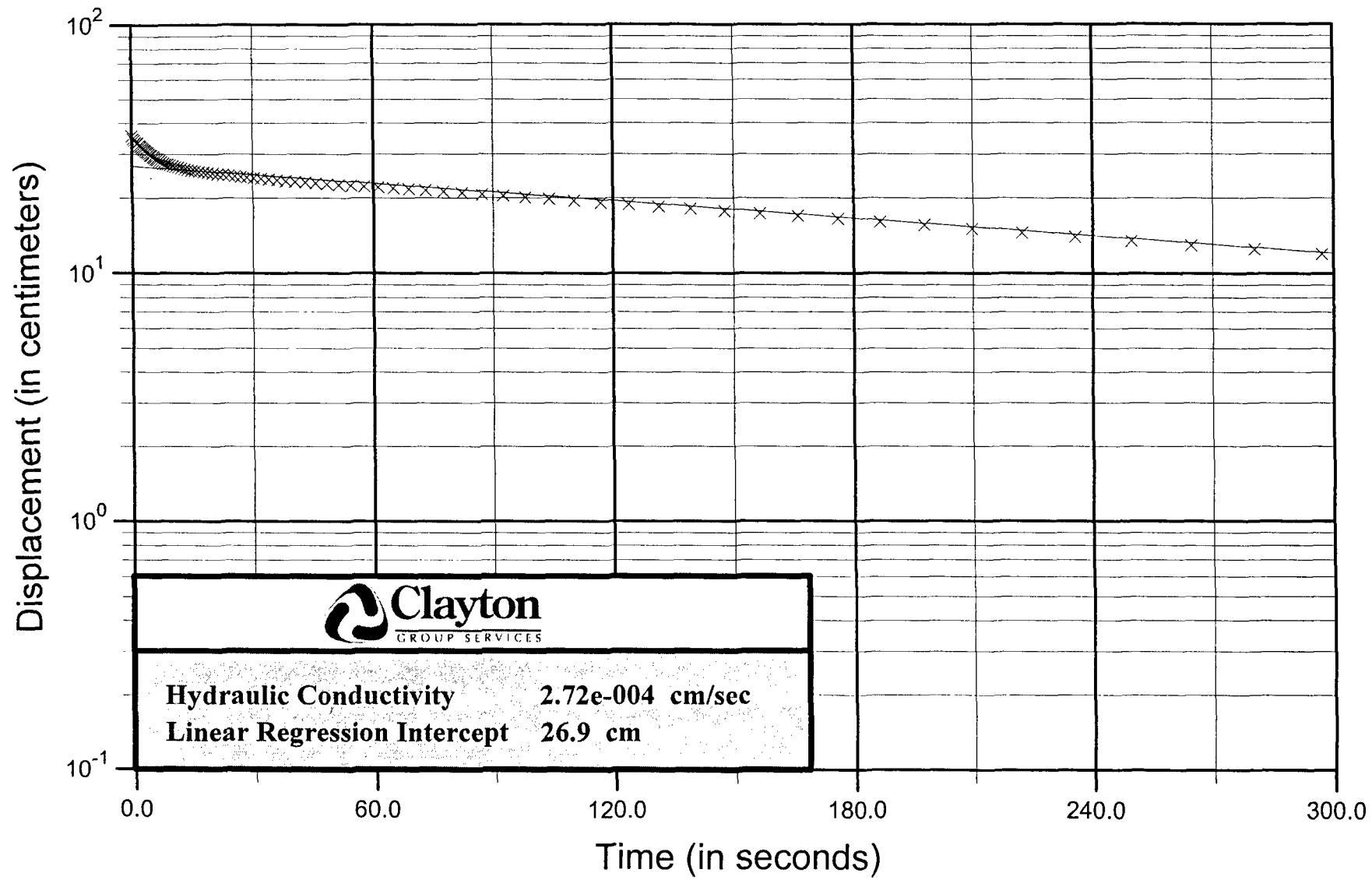


Bouwer and Rice Method (1976)

MW1100S FH (Plot vs. Predicted Curve)

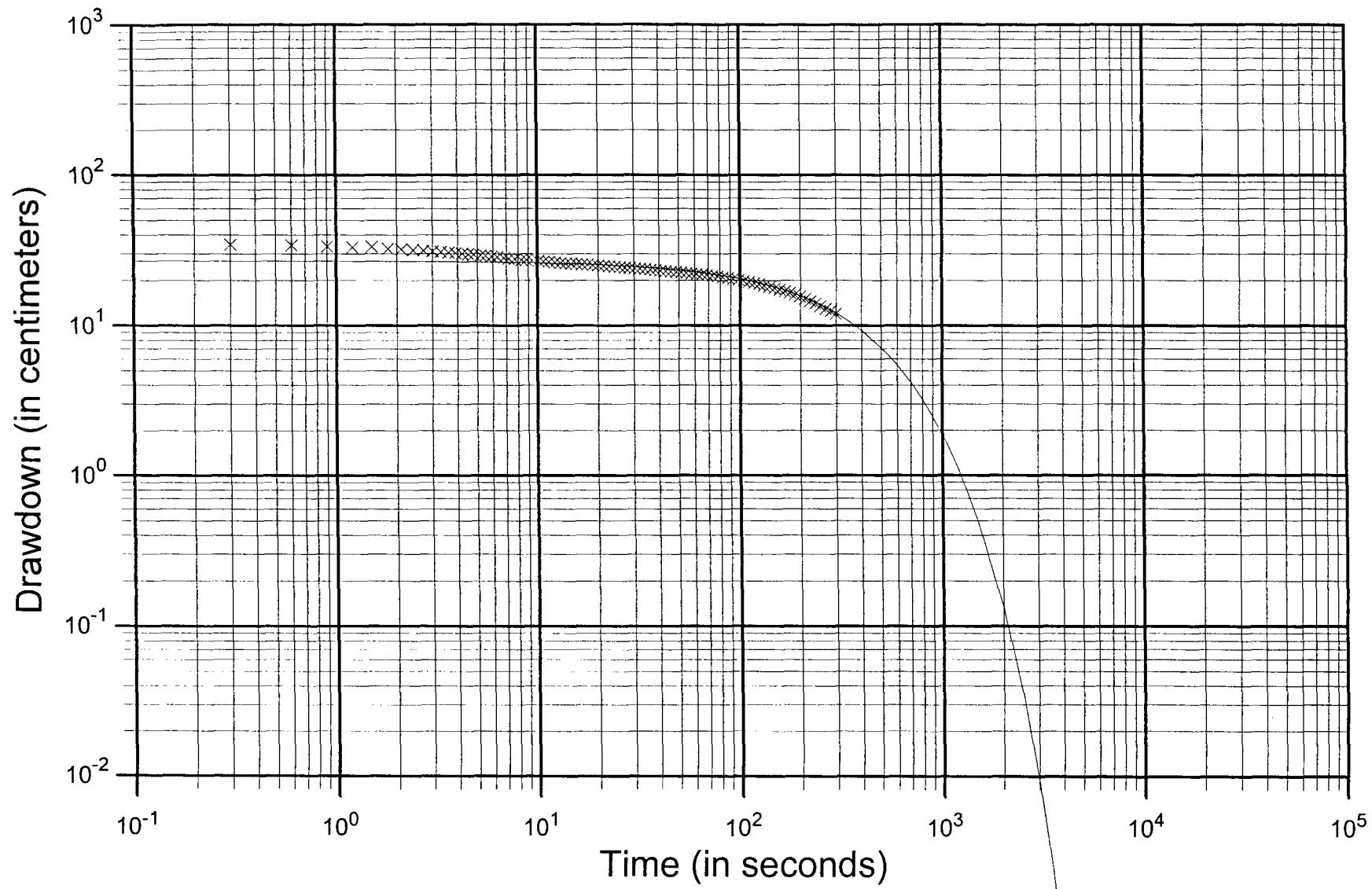


MW1100S Rising Head Slug Test

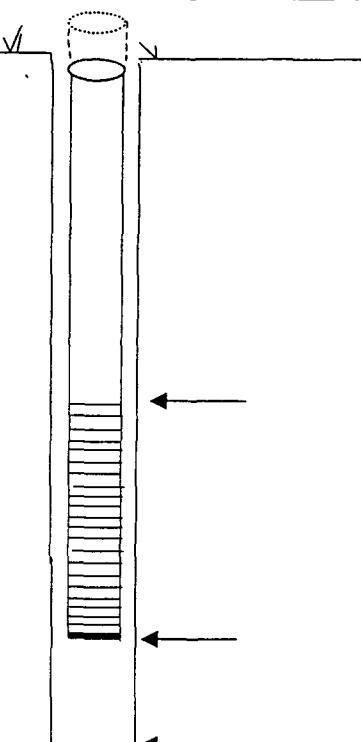


Bouwer and Rice Method (1976)

MW1100S RH (Plot vs. Predicted Curve)



SLUG TEST DATA FORM

PROJECT INFORMATION								
Project Name	Lockformer	Lisle, IL	Well ID	MW-1100S				
Project No.	15-65263.01-001		Test Date	6/2/2003				
Field Personnel	K. Woloszyn			Unconfined				
EQUIPMENT INFORMATION				ILLUSTRATION OF INFORMATION				
Data Logger Type / Model No.	In-Situ							
Transducer Type / Model No.	Minitroll #5914							
Slug Length / Volume	2 feet / 0.18 gallons							
GENERAL INFORMATION								
Static Groundwater Elevation	654.52 ft MSL							
Ground Surface Elevation	688.1 ft MSL							
Top of Casing Elevation	690.42 ft MSL							
Well Stick-up	2.32	ft	70.7	cm				
Depth to Water	35.9	ft	1094.2	cm				
Diameter of Well Casing	2	in	5.1	cm				
Diameter of Borehole at Screen	8	in	20.3	cm				
Screen Interval	29.0 - 39.0	ft BG	884 - 1189	cm BG				
Screen Length	10	ft	304.8	cm				
Base of Boring	39	ft BG	1188.7	cm BG				
Base of Upper Confining Unit	---	ft BG	0.0	cm BG				
Top of Lower Confining Unit	---	ft BG	0.0	cm BG				
Saturated Thickness (b)	4	ft	121.9	cm				
Static Height of Water in Well	5.22	ft	159.1	cm				
Geology of Aquifer	Sand							
SLUG TEST MEASUREMENT INFORMATION								
Parameter	Falling Head			Rising Head				
Initial Water Level Above Transducer	3.5	ft	106.68	cm	3.5	ft	106.68	cm
Initial Drawdown/Recovery	1.61	ft	49.07	cm	1.17	ft	35.57	cm
SLUG TEST RESULTS								
Falling H	Rising H	Analysis Method		Parameter	Calculated Value and Units			
Notes:								

In-Situ Inc. MiniTroll Pro

Report generated: 6/3/2003 18:53:36
 Report from file: ...\\SN05914 2003-06-02 143715 MW1100S FH.bin
 Win-Situ Version 4.41

Serial number: 5914
 Firmware Version 3.07
 Unit name: MiniTROLL

Test name: MW1100S FH

Test defined on: 6/2/2003 14:36:27
 Test started on: 6/2/2003 14:37:15
 Test stopped on: 6/2/2003 14:39:33
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing
 Maximum time between data points: 600.0 Seconds.
 Number of data samples: 75

TOTAL DATA SAMPLES 75

Channel number [1]
 Measurement type: Temperature
 Channel name: Temperature

Channel number [2]
 Measurement type: Pressure
 Channel name: Pressure
 Sensor Range: 30 PSIG.
 Specific gravity: 1
 Mode: Surface
 User-defined reference: 0 Feet H2O
 Referenced on: test start
 Pressure head at reference: 4.856 Feet H2O

Slug Size: 2ft x 1.5 in
Depth to water (bgs)=33.60'
Screen length (amount exposed to aquifer)=3.40'
Aquifer thickness=3.40'
Top of screen (water above screen)=0

Date	Time	ET (sec)	Chan[1] Fahrenheit	Chan[2] Feet H2O	Time (sec)	Head (cm)
6/2/2003	14:37:15	0	54.23	0	-1.5	0.00
6/2/2003	14:37:15	0.3	54.26	0.498	-1.2	15.18
6/2/2003	14:37:15	0.6	54.28	3.122	-0.9	95.16
6/2/2003	14:37:16	0.9	54.28	1.181	-0.6	36.00
6/2/2003	14:37:16	1.2	54.28	-0.47	-0.3	-14.33
6/2/2003	14:37:16	1.5	54.28	1.61	0.0	49.07

Date	Time	ET (sec)	Fahrenheit	Feet H2O	Time (sec)	Head (cm)
6/2/2003	14:37:16	1.8	54.28	-0.549		
6/2/2003	14:37:17	2.1	54.28	0.985	0.6	30.02
6/2/2003	14:37:17	2.4	54.28	0.548	0.9	16.70
6/2/2003	14:37:17	2.7	54.28	0.567	1.2	17.28
6/2/2003	14:37:18	3	54.28	0.602	1.5	18.35
6/2/2003	14:37:18	3.3	54.28	0.609	1.8	18.56
6/2/2003	14:37:18	3.6	54.28	0.611	2.1	18.62
6/2/2003	14:37:19	3.9	54.3	0.611	2.4	18.62
6/2/2003	14:37:19	4.2	54.28	0.611	2.7	18.62
6/2/2003	14:37:19	4.5	54.3	0.611	3.0	18.62
6/2/2003	14:37:19	4.8	54.3	0.611	3.3	18.62
6/2/2003	14:37:20	5.1	54.28	0.604	3.6	18.41
6/2/2003	14:37:20	5.4	54.3	0.636	3.9	19.39
6/2/2003	14:37:20	5.7	54.3	0.634	4.2	19.32
6/2/2003	14:37:21	6	54.3	0.609	4.5	18.56
6/2/2003	14:37:21	6.4	54.3	0.613	4.9	18.68
6/2/2003	14:37:21	6.7	54.3	0.607	5.2	18.50
6/2/2003	14:37:22	7.1	54.3	0.601	5.6	18.32
6/2/2003	14:37:22	7.5	54.3	0.601	6.0	18.32
6/2/2003	14:37:23	8	54.3	0.601	6.5	18.32
6/2/2003	14:37:23	8.4	54.3	0.598	6.9	18.23
6/2/2003	14:37:24	8.9	54.3	0.596	7.4	18.17
6/2/2003	14:37:24	9.5	54.3	0.594	8.0	18.11
6/2/2003	14:37:25	10	54.28	0.584	8.5	17.80
6/2/2003	14:37:25	10.6	54.28	0.581	9.1	17.71
6/2/2003	14:37:26	11.3	54.26	0.577	9.8	17.59
6/2/2003	14:37:27	11.9	54.28	0.573	10.4	17.47
6/2/2003	14:37:27	12.6	54.26	0.567	11.1	17.28
6/2/2003	14:37:28	13.4	54.26	0.565	11.9	17.22
6/2/2003	14:37:29	14.2	54.26	0.56	12.7	17.07
6/2/2003	14:37:30	15	54.26	0.558	13.5	17.01
6/2/2003	14:37:31	15.9	54.26	0.554	14.4	16.89
6/2/2003	14:37:31	16.8	54.26	0.548	15.3	16.70
6/2/2003	14:37:32	17.8	54.26	0.544	16.3	16.58
6/2/2003	14:37:34	18.9	54.26	0.54	17.4	16.46
6/2/2003	14:37:35	20	54.26	0.537	18.5	16.37
6/2/2003	14:37:36	21.2	54.23	0.531	19.7	16.18
6/2/2003	14:37:37	22.4	54.23	0.529	20.9	16.12
6/2/2003	14:37:38	23.8	54.23	0.523	22.3	15.94
6/2/2003	14:37:40	25.2	54.23	0.518	23.7	15.79
6/2/2003	14:37:41	26.7	54.23	0.512	25.2	15.61
6/2/2003	14:37:43	28.2	54.23	0.506	26.7	15.42
6/2/2003	14:37:44	29.8	54.23	0.502	28.3	15.30
6/2/2003	14:37:46	31.5	54.23	0.495	30.0	15.09
6/2/2003	14:37:48	33.3	54.23	0.489	31.8	14.90
6/2/2003	14:37:50	35.2	54.21	0.483	33.7	14.72
6/2/2003	14:37:52	37.3	54.21	0.478	35.8	14.57
6/2/2003	14:37:54	39.5	54.21	0.47	38.0	14.33
6/2/2003	14:37:56	41.8	54.21	0.464	40.3	14.14
6/2/2003	14:37:59	44.3	54.21	0.456	42.8	13.90

Date	Time	ET (sec)	Fahrenheit	Feet H2O	Time (sec)	Head (cm)
6/2/2003	14:38:02	46.9	54.21	0.449	45.4	13.69
6/2/2003	14:38:04	49.7	54.21	0.441	48.2	13.44
6/2/2003	14:38:07	52.6	54.19	0.434	51.1	13.23
6/2/2003	14:38:10	55.7	54.19	0.424	54.2	12.92
6/2/2003	14:38:14	59	54.19	0.416	57.5	12.68
6/2/2003	14:38:17	62.5	54.19	0.409	61.0	12.47
6/2/2003	14:38:21	66.2	54.19	0.399	64.7	12.16
6/2/2003	14:38:25	70.1	54.19	0.395	68.6	12.04
6/2/2003	14:38:29	74.3	54.19	0.386	72.8	11.77
6/2/2003	14:38:33	78.7	54.19	0.376	77.2	11.46
6/2/2003	14:38:38	83.4	54.16	0.369	81.9	11.25
6/2/2003	14:38:43	88.4	54.16	0.361	86.9	11.00
6/2/2003	14:38:48	93.7	54.16	0.351	92.2	10.70
6/2/2003	14:38:54	99.3	54.16	0.342	97.8	10.42
6/2/2003	14:39:00	105.2	54.14	0.332	103.7	10.12
6/2/2003	14:39:06	111.5	54.14	0.321	110.0	9.78
6/2/2003	14:39:13	118.1	54.14	0.313	116.6	9.54
6/2/2003	14:39:20	125.1	54.14	0.303	123.6	9.24
6/2/2003	14:39:27	132.6	54.14	0.292	131.1	8.90

In-Situ Inc.

MiniTroll Pro

Report generated:

6/3/2003 18:54:16

Report from file:

...\SN05914 2003-06-02 144039 MW1100S RH.bin

Win-Situ Version

4.41

Serial number:

5914

Firmware Version

3.07

Unit name:

MiniTROLL

Test name:

MW1100S RH

Test defined on: 6/2/2003 14:40:14

Test started on: 6/2/2003 14:40:39

Test stopped on: 6/2/2003 14:45:48

Test extracted on: N/A N/A

Data gathered using Logarithmic testing

Maximum time between data points: 600.0 Seconds.

Number of data samples: 89

TOTAL DATA SAMPLES 89

Channel number [1]

Measurement type: Temperature

Channel name: Temperature

Channel number [2]

Measurement type: Pressure

Channel name: Pressure

Sensor Range: 30 PSIG.

Specific gravity: 1

Mode: TOC

User-defined reference: 0 Feet H2O

Referenced on: test start

Pressure head at reference: 5.097 Feet H2O

Slug Size: 2ft x 1.5 in

Depth to water (bgs)=33.60'

Screen length (amount exposed to aquifer)=3.40'

Aquifer thickness=3.40'

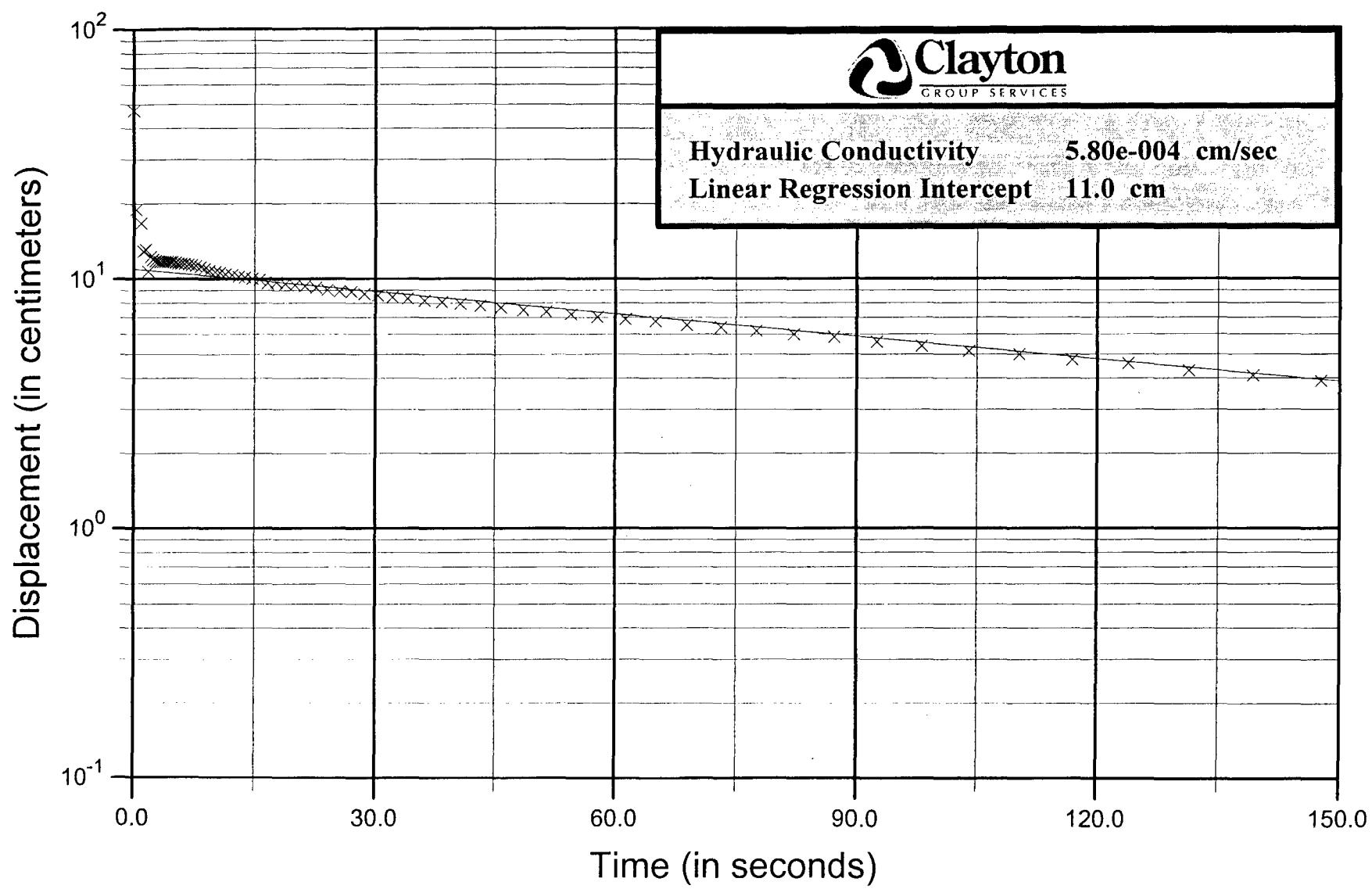
Top of screen (water above screen)=0

Date	Time	ET (sec)	Chan[1] Farenheit	Chan[2] Feet H2O	Time (sec)	Head (cm)
6/2/2003	14:40:39	0	54.21	0	-1.2	0.00
6/2/2003	14:40:39	0.3	54.23	1.917	-0.9	58.43
6/2/2003	14:40:40	0.6	54.23	4.547	-0.6	138.59
6/2/2003	14:40:40	0.9	54.23	1.045	-0.3	31.85
6/2/2003	14:40:40	1.2	54.23	1.167	0.0	35.57

Date	Time	ET (sec)	Fahrenheit	Chan[1]	Chan[2]	Time (sec)	Head (cm)
			Feet H2O				
6/2/2003	14:40:41	1.5	54.26	1.136	0.3	34.63	
6/2/2003	14:40:41	1.8	54.26	1.121	0.6	34.17	
6/2/2003	14:40:41	2.1	54.26	1.1	0.9	33.53	
6/2/2003	14:40:42	2.4	54.26	1.09	1.2	33.22	
6/2/2003	14:40:42	2.7	54.26	1.096	1.5	33.41	
6/2/2003	14:40:42	3	54.26	1.065	1.8	32.46	
6/2/2003	14:40:42	3.3	54.26	1.055	2.1	32.16	
6/2/2003	14:40:43	3.6	54.26	1.044	2.4	31.82	
6/2/2003	14:40:43	3.9	54.26	1.034	2.7	31.52	
6/2/2003	14:40:43	4.2	54.26	1.025	3.0	31.24	
6/2/2003	14:40:44	4.5	54.26	1.015	3.3	30.94	
6/2/2003	14:40:44	4.8	54.26	1.005	3.6	30.63	
6/2/2003	14:40:44	5.1	54.26	0.998	3.9	30.42	
6/2/2003	14:40:45	5.4	54.28	0.988	4.2	30.11	
6/2/2003	14:40:45	5.7	54.28	0.979	4.5	29.84	
6/2/2003	14:40:45	6	54.28	0.973	4.8	29.66	
6/2/2003	14:40:46	6.4	54.28	0.963	5.2	29.35	
6/2/2003	14:40:46	6.7	54.28	0.954	5.5	29.08	
6/2/2003	14:40:46	7.1	54.28	0.944	5.9	28.77	
6/2/2003	14:40:47	7.5	54.28	0.936	6.3	28.53	
6/2/2003	14:40:47	8	54.28	0.927	6.8	28.25	
6/2/2003	14:40:48	8.4	54.28	0.917	7.2	27.95	
6/2/2003	14:40:48	8.9	54.28	0.907	7.7	27.65	
6/2/2003	14:40:49	9.5	54.28	0.898	8.3	27.37	
6/2/2003	14:40:49	10	54.26	0.897	8.8	27.34	
6/2/2003	14:40:50	10.6	54.26	0.892	9.4	27.19	
6/2/2003	14:40:50	11.3	54.26	0.884	10.1	26.94	
6/2/2003	14:40:51	11.9	54.26	0.876	10.7	26.70	
6/2/2003	14:40:52	12.6	54.26	0.871	11.4	26.55	
6/2/2003	14:40:53	13.4	54.26	0.865	12.2	26.37	
6/2/2003	14:40:53	14.2	54.26	0.859	13.0	26.18	
6/2/2003	14:40:54	15	54.26	0.853	13.8	26.00	
6/2/2003	14:40:55	15.9	54.26	0.847	14.7	25.82	
6/2/2003	14:40:56	16.8	54.26	0.844	15.6	25.73	
6/2/2003	14:40:57	17.8	54.26	0.838	16.6	25.54	
6/2/2003	14:40:58	18.9	54.26	0.834	17.7	25.42	
6/2/2003	14:40:59	20	54.26	0.83	18.8	25.30	
6/2/2003	14:41:00	21.2	54.26	0.826	20.0	25.18	
6/2/2003	14:41:02	22.4	54.26	0.82	21.2	24.99	
6/2/2003	14:41:03	23.8	54.26	0.815	22.6	24.84	
6/2/2003	14:41:04	25.2	54.26	0.811	24.0	24.72	
6/2/2003	14:41:06	26.7	54.26	0.805	25.5	24.54	
6/2/2003	14:41:07	28.2	54.26	0.799	27.0	24.35	
6/2/2003	14:41:09	29.8	54.26	0.795	28.6	24.23	
6/2/2003	14:41:11	31.5	54.28	0.79	30.3	24.08	
6/2/2003	14:41:12	33.3	54.28	0.786	32.1	23.96	
6/2/2003	14:41:14	35.2	54.28	0.78	34.0	23.77	
6/2/2003	14:41:16	37.3	54.28	0.775	36.1	23.62	
6/2/2003	14:41:19	39.5	54.28	0.769	38.3	23.44	

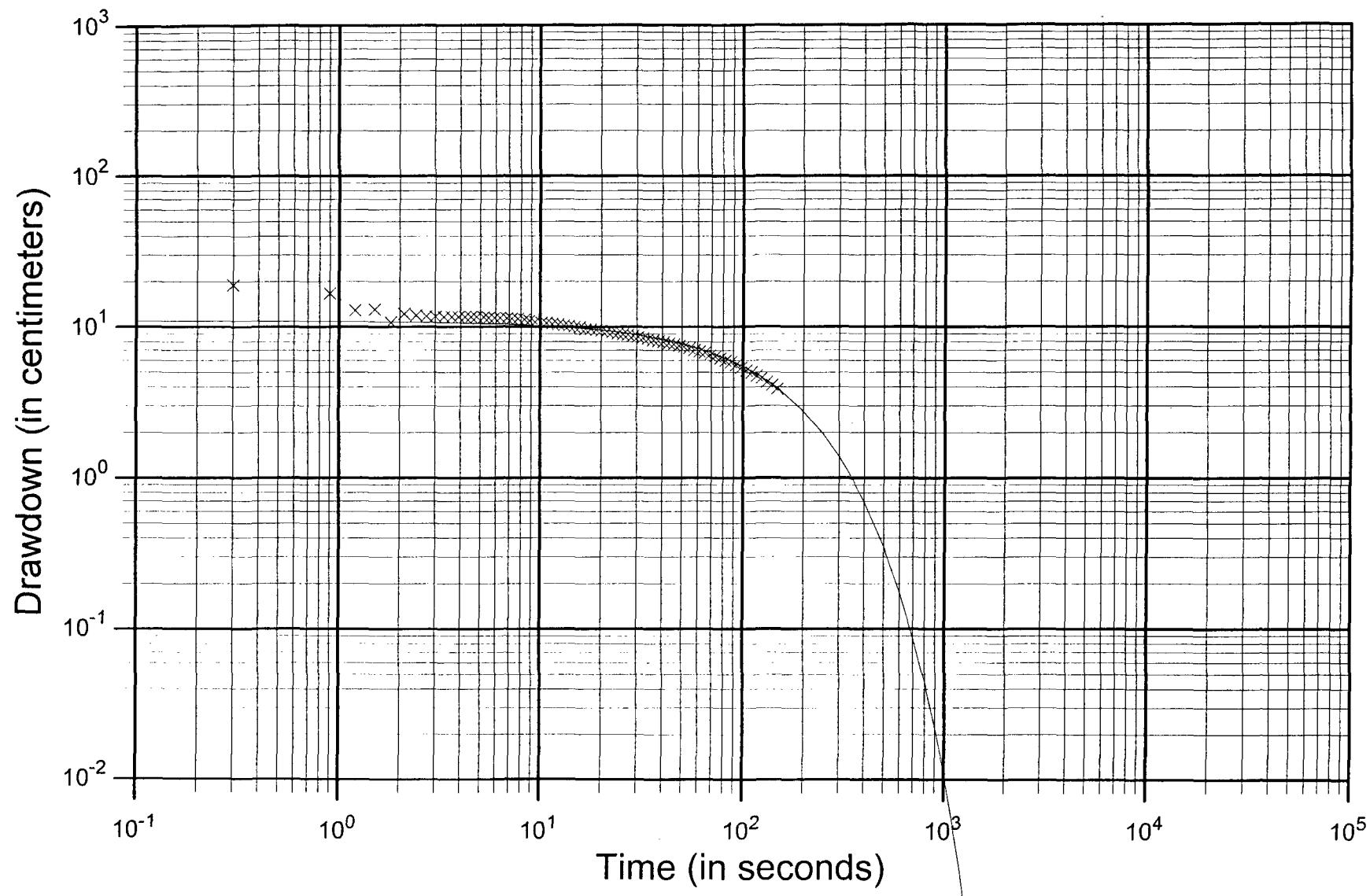
Date	Time	ET (sec)	Chan[1]	Chan[2]	Time (sec)	Head (cm)
			Fahrenheit	Feet H2O		
6/2/2003	14:41:21	41.8	54.3	0.763	40.6	23.26
6/2/2003	14:41:23	44.3	54.3	0.76	43.1	23.16
6/2/2003	14:41:26	46.9	54.3	0.754	45.7	22.98
6/2/2003	14:41:29	49.7	54.3	0.748	48.5	22.80
6/2/2003	14:41:32	52.6	54.3	0.742	51.4	22.62
6/2/2003	14:41:35	55.7	54.3	0.736	54.5	22.43
6/2/2003	14:41:38	59	54.32	0.731	57.8	22.28
6/2/2003	14:41:42	62.5	54.3	0.725	61.3	22.10
6/2/2003	14:41:45	66.2	54.3	0.719	65.0	21.92
6/2/2003	14:41:49	70.1	54.32	0.714	68.9	21.76
6/2/2003	14:41:53	74.3	54.32	0.706	73.1	21.52
6/2/2003	14:41:58	78.7	54.32	0.698	77.5	21.28
6/2/2003	14:42:03	83.4	54.32	0.689	82.2	21.00
6/2/2003	14:42:08	88.4	54.32	0.679	87.2	20.70
6/2/2003	14:42:13	93.7	54.32	0.671	92.5	20.45
6/2/2003	14:42:18	99.3	54.35	0.66	98.1	20.12
6/2/2003	14:42:24	105.2	54.35	0.651	104.0	19.84
6/2/2003	14:42:31	111.5	54.35	0.641	110.3	19.54
6/2/2003	14:42:37	118.1	54.35	0.629	116.9	19.17
6/2/2003	14:42:44	125.1	54.35	0.618	123.9	18.84
6/2/2003	14:42:52	132.6	54.35	0.606	131.4	18.47
6/2/2003	14:43:00	140.5	54.35	0.595	139.3	18.14
6/2/2003	14:43:08	148.9	54.35	0.583	147.7	17.77
6/2/2003	14:43:17	157.8	54.35	0.57	156.6	17.37
6/2/2003	14:43:26	167.2	54.35	0.556	166.0	16.95
6/2/2003	14:43:36	177.2	54.35	0.543	176.0	16.55
6/2/2003	14:43:47	187.8	54.35	0.527	186.6	16.06
6/2/2003	14:43:58	199	54.35	0.512	197.8	15.61
6/2/2003	14:44:10	210.9	54.35	0.495	209.7	15.09
6/2/2003	14:44:23	223.5	54.35	0.477	222.3	14.54
6/2/2003	14:44:36	236.8	54.32	0.46	235.6	14.02
6/2/2003	14:44:50	250.9	54.35	0.443	249.7	13.50
6/2/2003	14:45:05	265.8	54.35	0.425	264.6	12.95
6/2/2003	14:45:21	281.6	54.35	0.41	280.4	12.50
6/2/2003	14:45:38	298.4	54.35	0.393	297.2	11.98

MW1101S Falling Head Slug Test

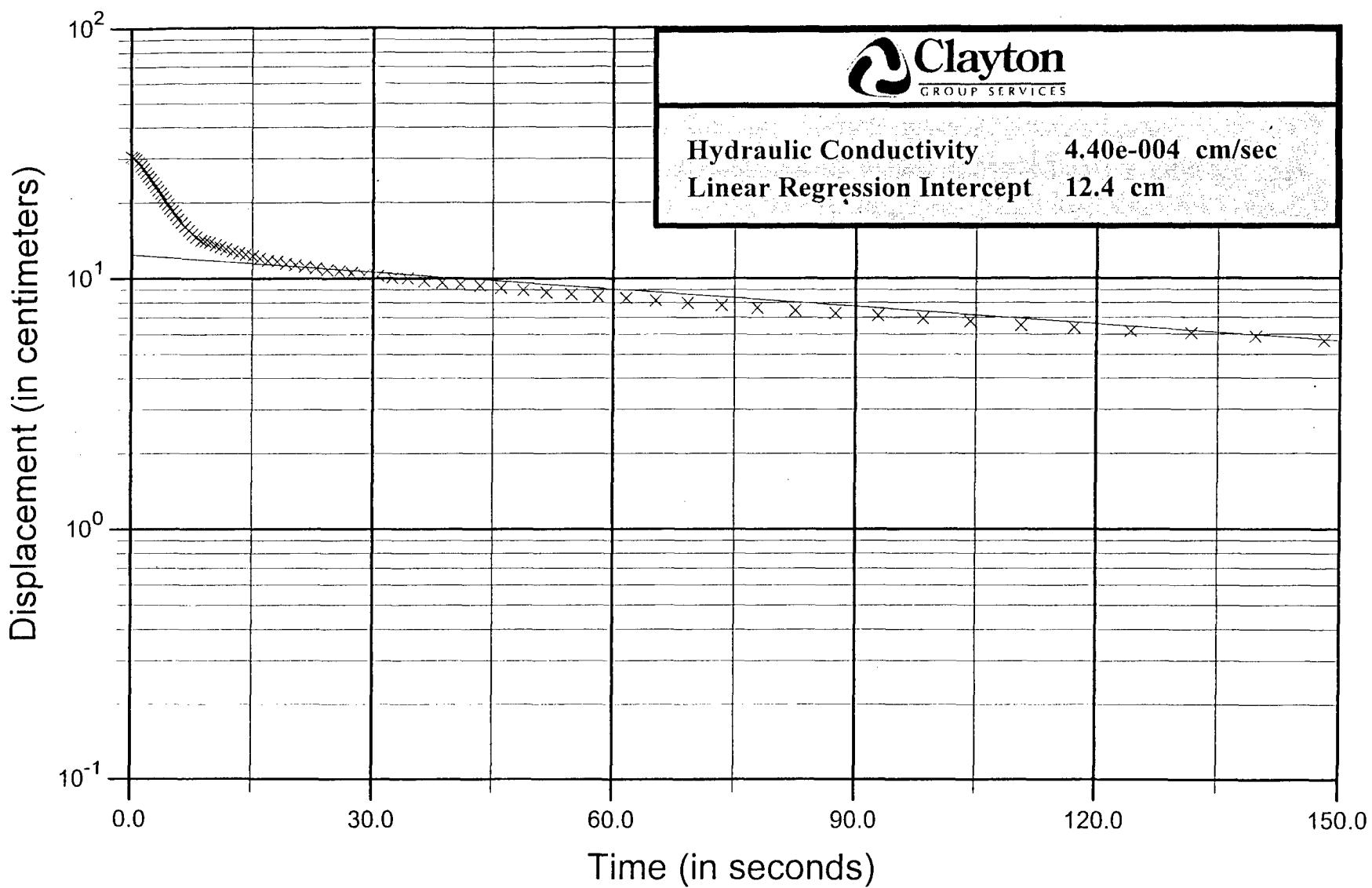


Bouwer and Rice Method (1976)

MW1101S FH (Plot vs. Predicted Curve)

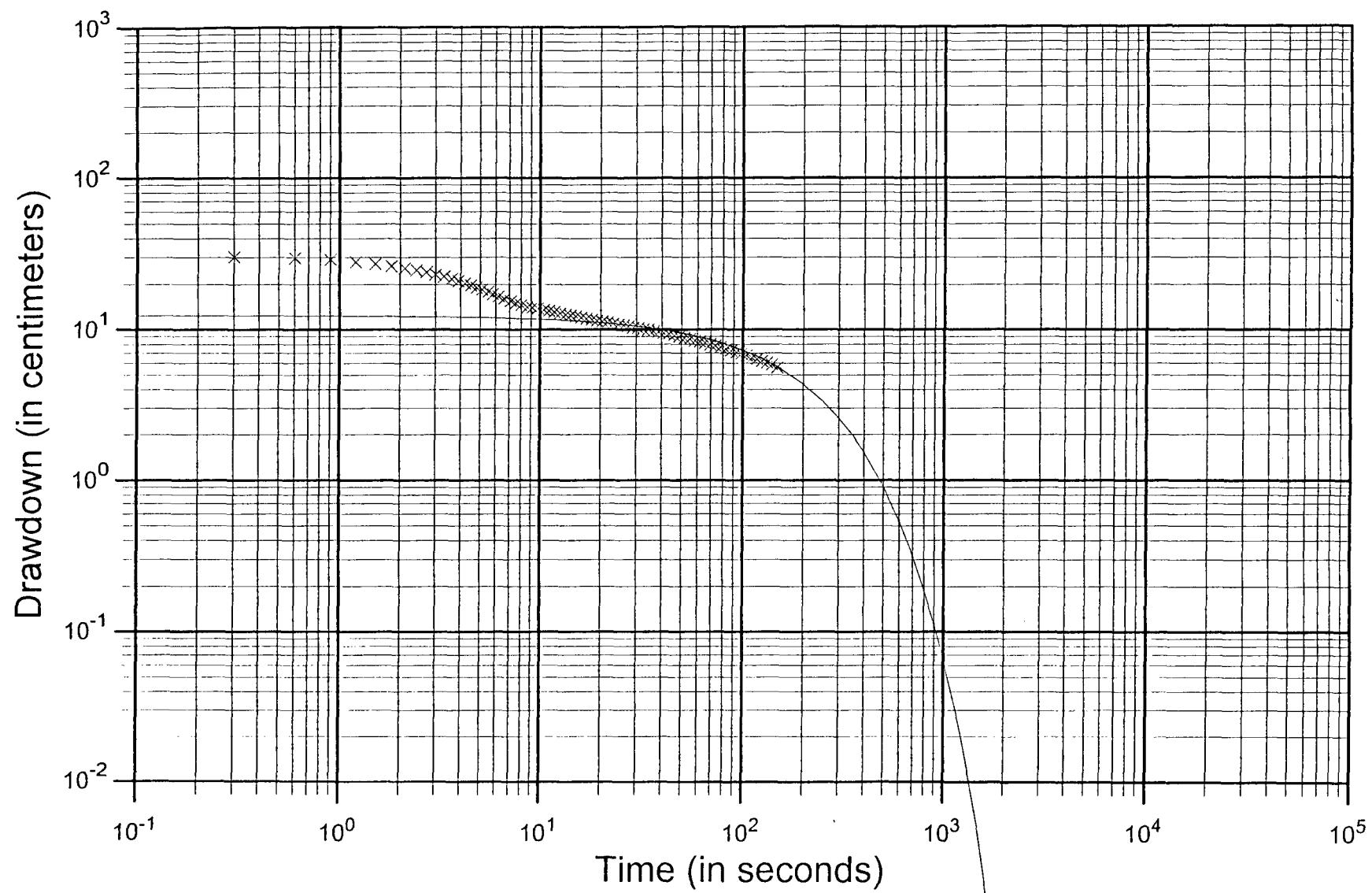


MW1101S Rising Head Slug Test

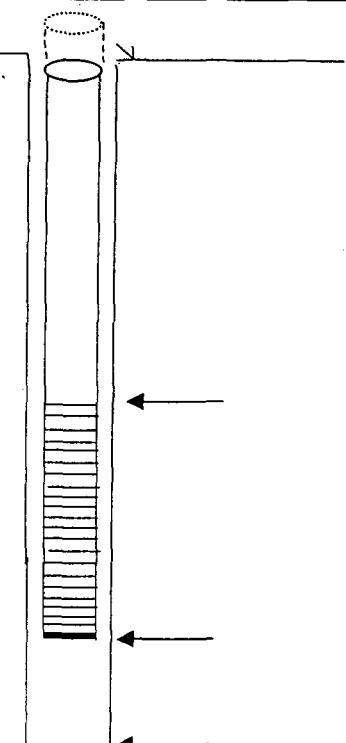


Bouwer and Rice Method (1976)

MW1101S RH (Plot vs. Predicted Curve)



SLUG TEST DATA FORM

PROJECT INFORMATION				ILLUSTRATION OF INFORMATION			
Project Name Lockformer Lisle, IL				Well ID MW-1101S			
Project No. 15-65263.01-001				Test Date 6/2/2003			
Field Personnel K. Woloszyn				Unconfined			
EQUIPMENT INFORMATION				ILLUSTRATION OF INFORMATION			
Data Logger Type / Model No. In-Situ							
Transducer Type / Model No. Minitroll #5914							
Slug Length / Volume 2 feet / 0.18 gallons							
GENERAL INFORMATION							
Static Groundwater Elevation	654.9 ft MSL						
Ground Surface Elevation	688.3 ft MSL						
Top of Casing Elevation	690.82 ft MSL						
Well Stick-up	2.52	ft	76.8 cm				
Depth to Water	35.92	ft	1094.8 cm				
Diameter of Well Casing	2	in	5.1 cm				
Diameter of Borehole at Screen	8	in	20.3 cm				
Screen Interval	29.0 - 39.0	ft BG	884 - 1189 cm BG				
Screen Length	10	ft	304.8 cm				
Base of Boring	40	ft BG	1219.2 cm BG				
Base of Upper Confining Unit	---	ft BG	0.0 cm BG				
Top of Lower Confining Unit	---	ft BG	0.0 cm BG				
Saturated Thickness (b)	6	ft	182.9 cm				
Static Height of Water in Well	5.2	ft	158.5 cm				
Geology of Aquifer	Sand						
SLUG TEST MEASUREMENT INFORMATION							
Parameter		Falling Head			Rising Head		
Initial Water Level Above Transducer		4	ft	121.92	cm	4	ft
Initial Drawdown/Recovery		1.55	ft	47.15	cm	1.00	ft
SLUG TEST RESULTS							
Falling H	Rising H	Analysis Method		Parameter	Calculated Value and Units		
Notes:							

In-Situ Inc. MiniTroll Pro

Report generated: 6/3/2003 18:54:52
 Report from file: ...\\SN05914 2003-06-02 150048 MW1101S FH.bin
 Win-Situ Version 4.41

Serial number: 5914
 Firmware Version 3.07
 Unit name: MiniTROLL

Test name: MW1101S FH

Test defined on: 6/2/2003 14:59:59
 Test started on: 6/2/2003 15:00:48
 Test stopped on: 6/2/2003 15:03:21
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing
 Maximum time between data points: 600.0 Seconds.
 Number of data samples: 77

TOTAL DATA SAMPLES 77

Channel number [1]
 Measurement type: Temperature
 Channel name: Temperature

Channel number [2]
 Measurement type: Pressure
 Channel name: Pressure
 Sensor Range: 30 PSIG.
 Specific gravity: 1
 Mode: Surface
 User-defined reference: 0 Feet H2O
 Referenced on: test start
 Pressure head at reference: 4.539 Feet H2O

Slug Size: 2ft x 1.5 in
Depth to water (bgs)=33.77'
Screen length (amount exposed to aquifer)=3.23'
Aquifer thickness=3.23'
Top of screen (water above screen)=0

Date	Time	ET (sec)	Chan[1] Fahrenheit	Chan[2] Feet H2O	Time (sec)	Head (cm)
6/2/2003	15:00:48	0	53.94	0	-1.2	0.00
6/2/2003	15:00:49	0.3	53.96	0.013	-0.9	0.40
6/2/2003	15:00:49	0.6	53.98	0.019	-0.6	0.58
6/2/2003	15:00:49	0.9	53.98	1.212	-0.3	36.94
6/2/2003	15:00:50	1.2	53.98	1.547	0.0	47.15
6/2/2003	15:00:50	1.5	53.98	0.621	0.3	18.93

Date	Time	ET (sec)	Chan[1]	Chan[2]	Time (sec)	Head (cm)
			Fahrenheit	Feet H2O		
6/2/2003	15:00:50	1.8	53.98	0.194		
6/2/2003	15:00:51	2.1	53.98	0.548	0.9	16.70
6/2/2003	15:00:51	2.4	53.98	0.423	1.2	12.89
6/2/2003	15:00:51	2.7	53.98	0.43	1.5	13.11
6/2/2003	15:00:51	3	53.98	0.352	1.8	10.73
6/2/2003	15:00:52	3.3	53.98	0.402	2.1	12.25
6/2/2003	15:00:52	3.6	53.98	0.392	2.4	11.95
6/2/2003	15:00:52	3.9	53.98	0.388	2.7	11.83
6/2/2003	15:00:53	4.2	53.98	0.386	3.0	11.77
6/2/2003	15:00:53	4.5	53.98	0.384	3.3	11.70
6/2/2003	15:00:53	4.8	53.98	0.384	3.6	11.70
6/2/2003	15:00:54	5.1	53.98	0.384	3.9	11.70
6/2/2003	15:00:54	5.4	53.98	0.384	4.2	11.70
6/2/2003	15:00:54	5.7	53.98	0.384	4.5	11.70
6/2/2003	15:00:54	6	53.98	0.384	4.8	11.70
6/2/2003	15:00:55	6.4	53.98	0.382	5.2	11.64
6/2/2003	15:00:55	6.7	53.98	0.378	5.5	11.52
6/2/2003	15:00:56	7.1	53.98	0.378	5.9	11.52
6/2/2003	15:00:56	7.5	53.98	0.377	6.3	11.49
6/2/2003	15:00:56	8	53.98	0.375	6.8	11.43
6/2/2003	15:00:57	8.4	53.98	0.373	7.2	11.37
6/2/2003	15:00:57	8.9	53.98	0.371	7.7	11.31
6/2/2003	15:00:58	9.5	53.98	0.367	8.3	11.19
6/2/2003	15:00:58	10	53.96	0.36	8.8	10.97
6/2/2003	15:00:59	10.6	53.96	0.354	9.4	10.79
6/2/2003	15:01:00	11.3	53.94	0.35	10.1	10.67
6/2/2003	15:01:00	11.9	53.94	0.348	10.7	10.61
6/2/2003	15:01:01	12.6	53.94	0.343	11.4	10.45
6/2/2003	15:01:02	13.4	53.94	0.341	12.2	10.39
6/2/2003	15:01:03	14.2	53.94	0.335	13.0	10.21
6/2/2003	15:01:03	15	53.94	0.333	13.8	10.15
6/2/2003	15:01:04	15.9	53.91	0.329	14.7	10.03
6/2/2003	15:01:05	16.8	53.91	0.326	15.6	9.94
6/2/2003	15:01:06	17.8	53.91	0.316	16.6	9.63
6/2/2003	15:01:07	18.9	53.91	0.318	17.7	9.69
6/2/2003	15:01:08	20	53.91	0.314	18.8	9.57
6/2/2003	15:01:10	21.2	53.91	0.31	20.0	9.45
6/2/2003	15:01:11	22.4	53.89	0.307	21.2	9.36
6/2/2003	15:01:12	23.8	53.89	0.303	22.6	9.24
6/2/2003	15:01:14	25.2	53.89	0.297	24.0	9.05
6/2/2003	15:01:15	26.7	53.89	0.293	25.5	8.93
6/2/2003	15:01:17	28.2	53.87	0.292	27.0	8.90
6/2/2003	15:01:18	29.8	53.87	0.286	28.6	8.72
6/2/2003	15:01:20	31.5	53.87	0.282	30.3	8.60
6/2/2003	15:01:22	33.3	53.87	0.278	32.1	8.47
6/2/2003	15:01:24	35.2	53.87	0.274	34.0	8.35
6/2/2003	15:01:26	37.3	53.84	0.269	36.1	8.20
6/2/2003	15:01:28	39.5	53.84	0.265	38.3	8.08
6/2/2003	15:01:30	41.8	53.84	0.261	40.6	7.96

Date	Time	Chan[1]		Chan[2]		Time (sec)	Head (cm)
		ET (sec)	Fahrenheit	Feet H2O			
6/2/2003	15:01:33	44.3	53.82	0.256	43.1	7.80	
6/2/2003	15:01:35	46.9	53.82	0.252	45.7	7.68	
6/2/2003	15:01:38	49.7	53.82	0.246	48.5	7.50	
6/2/2003	15:01:41	52.6	53.8	0.243	51.4	7.41	
6/2/2003	15:01:44	55.7	53.8	0.237	54.5	7.22	
6/2/2003	15:01:47	59	53.78	0.231	57.8	7.04	
6/2/2003	15:01:51	62.5	53.78	0.226	61.3	6.89	
6/2/2003	15:01:55	66.2	53.75	0.222	65.0	6.77	
6/2/2003	15:01:58	70.1	53.75	0.214	68.9	6.52	
6/2/2003	15:02:03	74.3	53.75	0.21	73.1	6.40	
6/2/2003	15:02:07	78.7	53.73	0.203	77.5	6.19	
6/2/2003	15:02:12	83.4	53.73	0.197	82.2	6.00	
6/2/2003	15:02:17	88.4	53.71	0.192	87.2	5.85	
6/2/2003	15:02:22	93.7	53.69	0.184	92.5	5.61	
6/2/2003	15:02:28	99.3	53.69	0.177	98.1	5.39	
6/2/2003	15:02:34	105.2	53.66	0.169	104.0	5.15	
6/2/2003	15:02:40	111.5	53.66	0.164	110.3	5.00	
6/2/2003	15:02:46	118.1	53.64	0.156	116.9	4.75	
6/2/2003	15:02:53	125.1	53.64	0.151	123.9	4.60	
6/2/2003	15:03:01	132.6	53.62	0.141	131.4	4.30	
6/2/2003	15:03:09	140.5	53.62	0.135	139.3	4.11	
6/2/2003	15:03:17	148.9	53.59	0.128	147.7	3.90	

In-Situ Inc. MiniTroll Pro

Report generated: 6/3/2003 18:55:30
 Report from file: ...\\SN05914 2003-06-02 150428 MW1101S RH.bin
 Win-Situ Version 4.41

Serial number: 5914
 Firmware Version 3.07
 Unit name: MiniTROLL

Test name: MW1101S RH

Test defined on: 6/2/2003 15:04:07
 Test started on: 6/2/2003 15:04:28
 Test stopped on: 6/2/2003 15:06:57
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing
 Maximum time between data points: 600.0 Seconds.
 Number of data samples: 77

TOTAL DATA SAMPLES 77

Channel number [1]
 Measurement type: Temperature
 Channel name: Temperature

Channel number [2]
 Measurement type: Pressure
 Channel name: Pressure
 Sensor Range: 30 PSIG.
 Specific gravity: 1
 Mode: TOC
 User-defined reference: 0 Feet H2O
 Referenced on: test start
 Pressure head at reference: 4.628 Feet H2O

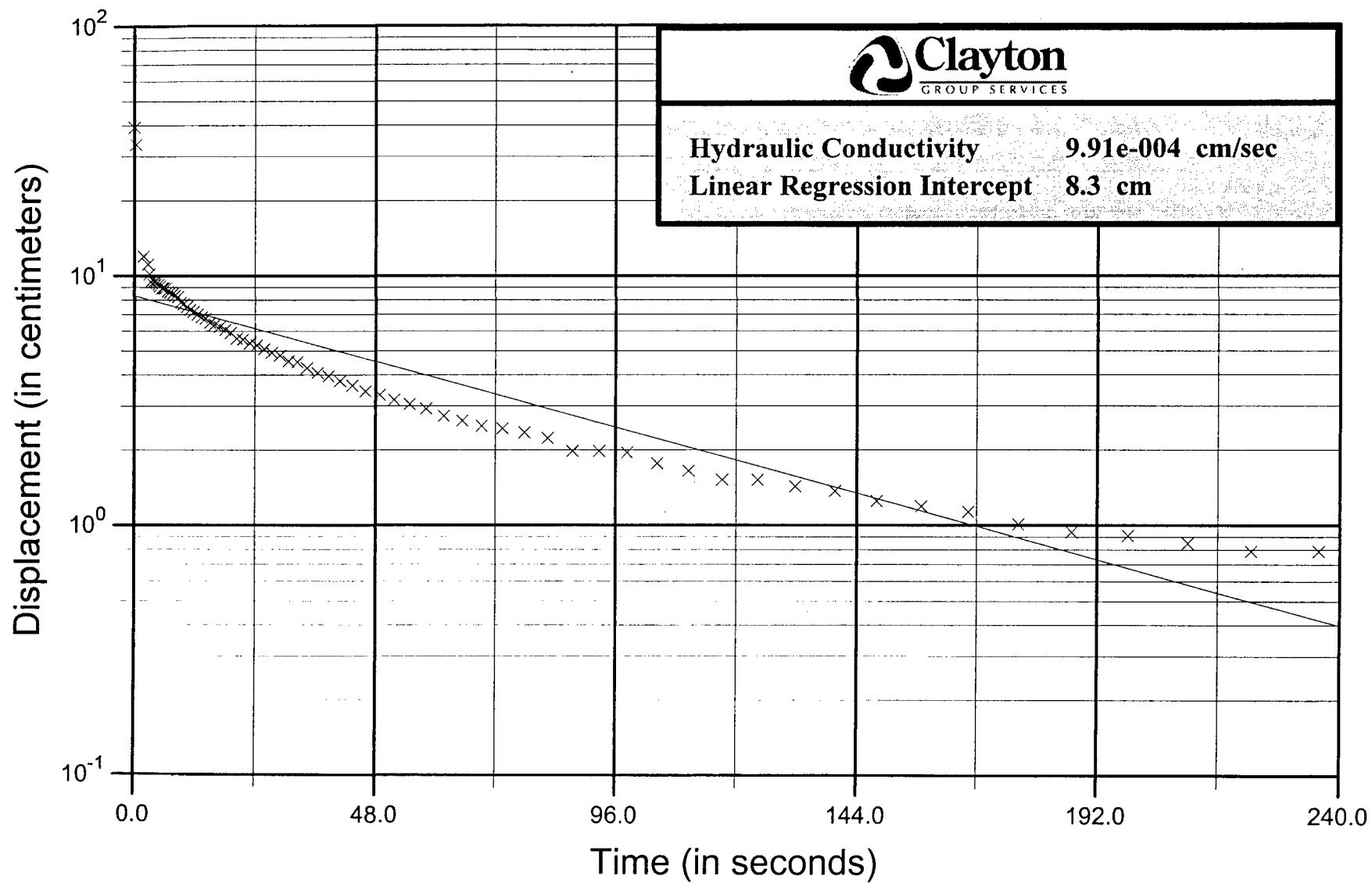
Slug Size: 2ft x 1.5 in
Depth to water (bgs)=33.77'
Screen length (amount exposed to aquifer)=3.23'
Aquifer thickness=3.23'
Top of screen (water above screen)=0

Date	Time	ET (sec)	Chan[1] Fahrenheit	Chan[2] Feet H2O	Time (sec)	Head (cm)
6/2/2003	15:04:28	0	53.53	0	-0.9	0.00
6/2/2003	15:04:28	0.3	53.57	2.813	-0.6	85.74
6/2/2003	15:04:29	0.6	53.57	0.901	-0.3	27.46
6/2/2003	15:04:29	0.9	53.57	1.001	0.0	30.51
6/2/2003	15:04:29	1.2	53.57	0.992	0.3	30.24
6/2/2003	15:04:29	1.5	53.57	0.978	0.6	29.81

Date	Time	ET (sec)	Chan[1]	Chan[2]	Time (sec)	Head (cm)
			Fahrenheit	Feet H2O		
6/2/2003	15:04:30	1.8	53.59	0.95	0.9	28.96
6/2/2003	15:04:30	2.1	53.59	0.921	1.2	28.07
6/2/2003	15:04:30	2.4	53.59	0.896	1.5	27.31
6/2/2003	15:04:31	2.7	53.59	0.865	1.8	26.37
6/2/2003	15:04:31	3	53.59	0.838	2.1	25.54
6/2/2003	15:04:31	3.3	53.59	0.813	2.4	24.78
6/2/2003	15:04:32	3.6	53.59	0.788	2.7	24.02
6/2/2003	15:04:32	3.9	53.59	0.761	3.0	23.20
6/2/2003	15:04:32	4.2	53.59	0.738	3.3	22.49
6/2/2003	15:04:32	4.5	53.59	0.715	3.6	21.79
6/2/2003	15:04:33	4.8	53.59	0.692	3.9	21.09
6/2/2003	15:04:33	5.1	53.59	0.669	4.2	20.39
6/2/2003	15:04:33	5.4	53.59	0.648	4.5	19.75
6/2/2003	15:04:34	5.7	53.59	0.626	4.8	19.08
6/2/2003	15:04:34	6	53.59	0.609	5.1	18.56
6/2/2003	15:04:34	6.4	53.59	0.588	5.5	17.92
6/2/2003	15:04:35	6.7	53.59	0.567	5.8	17.28
6/2/2003	15:04:35	7.1	53.59	0.548	6.2	16.70
6/2/2003	15:04:35	7.5	53.59	0.528	6.6	16.09
6/2/2003	15:04:36	8	53.59	0.511	7.1	15.58
6/2/2003	15:04:36	8.4	53.59	0.494	7.5	15.06
6/2/2003	15:04:37	8.9	53.59	0.48	8.0	14.63
6/2/2003	15:04:37	9.5	53.62	0.465	8.6	14.17
6/2/2003	15:04:38	10	53.59	0.461	9.1	14.05
6/2/2003	15:04:39	10.6	53.59	0.455	9.7	13.87
6/2/2003	15:04:39	11.3	53.59	0.446	10.4	13.59
6/2/2003	15:04:40	11.9	53.59	0.438	11.0	13.35
6/2/2003	15:04:41	12.6	53.57	0.43	11.7	13.11
6/2/2003	15:04:41	13.4	53.57	0.422	12.5	12.86
6/2/2003	15:04:42	14.2	53.57	0.414	13.3	12.62
6/2/2003	15:04:43	15	53.57	0.409	14.1	12.47
6/2/2003	15:04:44	15.9	53.57	0.403	15.0	12.28
6/2/2003	15:04:45	16.8	53.57	0.395	15.9	12.04
6/2/2003	15:04:46	17.8	53.57	0.387	16.9	11.80
6/2/2003	15:04:47	18.9	53.57	0.384	18.0	11.70
6/2/2003	15:04:48	20	53.57	0.376	19.1	11.46
6/2/2003	15:04:49	21.2	53.57	0.372	20.3	11.34
6/2/2003	15:04:50	22.4	53.57	0.366	21.5	11.16
6/2/2003	15:04:52	23.8	53.57	0.361	22.9	11.00
6/2/2003	15:04:53	25.2	53.57	0.355	24.3	10.82
6/2/2003	15:04:55	26.7	53.57	0.351	25.8	10.70
6/2/2003	15:04:56	28.2	53.57	0.345	27.3	10.52
6/2/2003	15:04:58	29.8	53.57	0.339	28.9	10.33
6/2/2003	15:04:59	31.5	53.57	0.336	30.6	10.24
6/2/2003	15:05:01	33.3	53.57	0.33	32.4	10.06
6/2/2003	15:05:03	35.2	53.57	0.328	34.3	10.00
6/2/2003	15:05:05	37.3	53.57	0.32	36.4	9.75
6/2/2003	15:05:07	39.5	53.57	0.316	38.6	9.63
6/2/2003	15:05:10	41.8	53.57	0.311	40.9	9.48

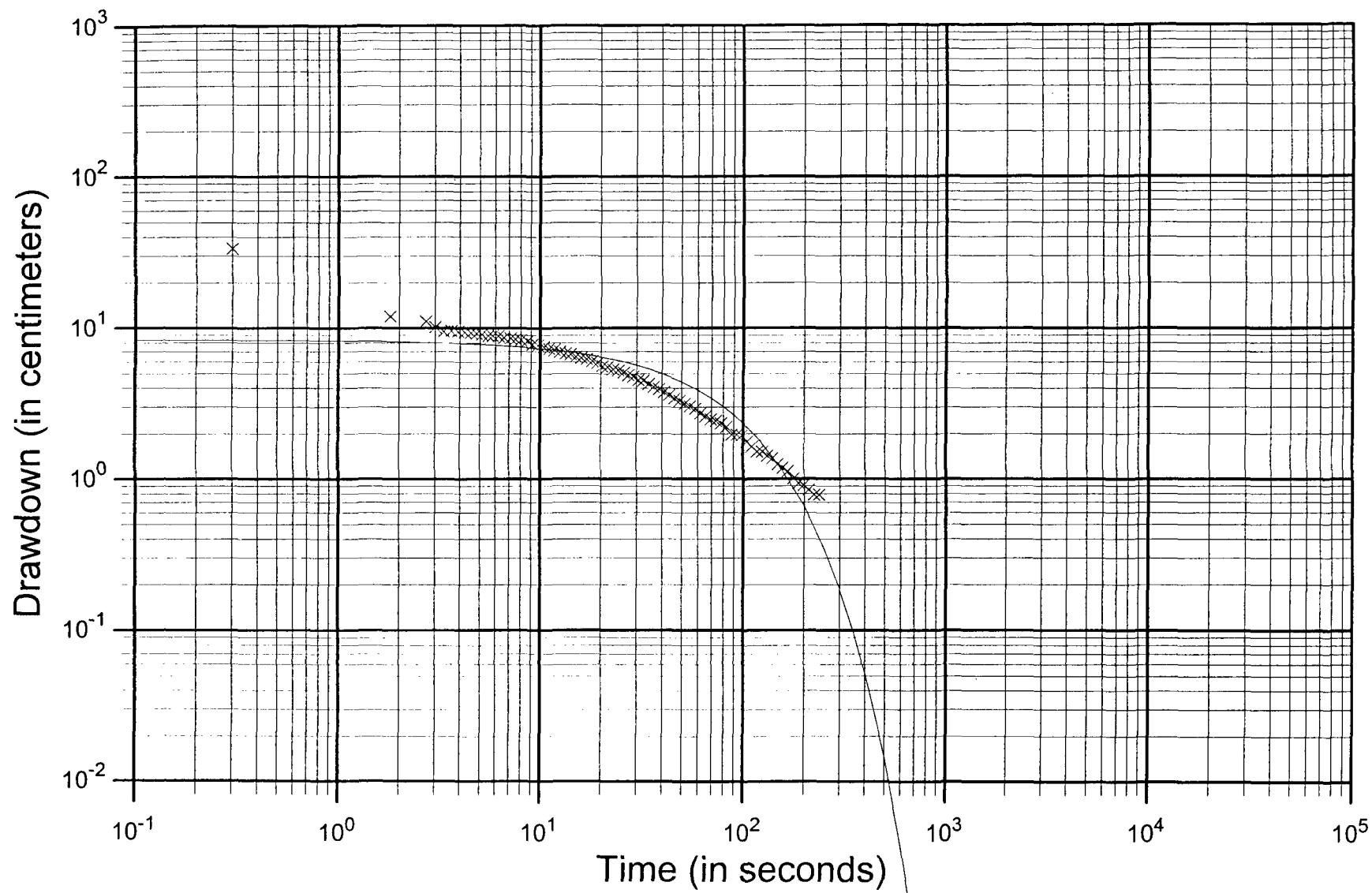
Date	Time	ET (sec)	Chan[1]	Chan[2]	Time (sec)	Head (cm)
			Fahrenheit	Feet H2O		
6/2/2003	15:05:12	44.3	53.57	0.307	43.4	9.36
6/2/2003	15:05:15	46.9	53.57	0.301	46.0	9.17
6/2/2003	15:05:18	49.7	53.57	0.295	48.8	8.99
6/2/2003	15:05:21	52.6	53.57	0.289	51.7	8.81
6/2/2003	15:05:24	55.7	53.57	0.284	54.8	8.66
6/2/2003	15:05:27	59	53.57	0.278	58.1	8.47
6/2/2003	15:05:30	62.5	53.57	0.274	61.6	8.35
6/2/2003	15:05:34	66.2	53.57	0.268	65.3	8.17
6/2/2003	15:05:38	70.1	53.57	0.262	69.2	7.99
6/2/2003	15:05:42	74.3	53.57	0.257	73.4	7.83
6/2/2003	15:05:47	78.7	53.57	0.251	77.8	7.65
6/2/2003	15:05:51	83.4	53.57	0.245	82.5	7.47
6/2/2003	15:05:56	88.4	53.57	0.239	87.5	7.28
6/2/2003	15:06:02	93.7	53.57	0.234	92.8	7.13
6/2/2003	15:06:07	99.3	53.57	0.228	98.4	6.95
6/2/2003	15:06:13	105.2	53.57	0.222	104.3	6.77
6/2/2003	15:06:19	111.5	53.57	0.214	110.6	6.52
6/2/2003	15:06:26	118.1	53.57	0.21	117.2	6.40
6/2/2003	15:06:33	125.1	53.57	0.203	124.2	6.19
6/2/2003	15:06:41	132.6	53.57	0.199	131.7	6.07
6/2/2003	15:06:48	140.5	53.57	0.193	139.6	5.88
6/2/2003	15:06:57	148.9	53.57	0.185	148.0	5.64

MW1102S Falling Head Slug Test

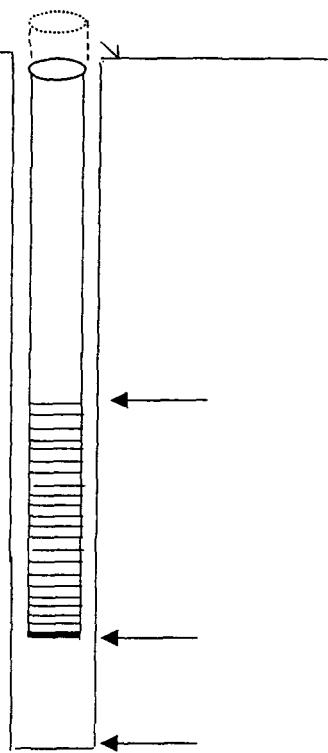
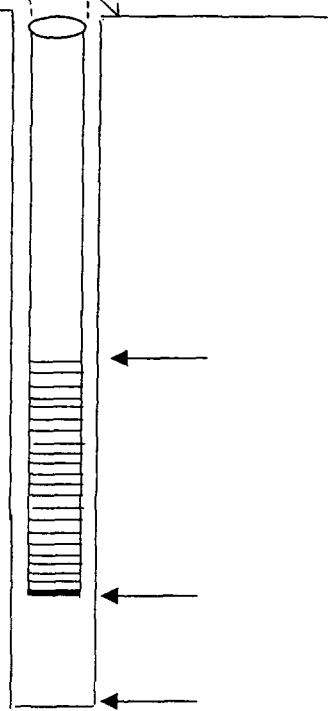


Bouwer and Rice Method (1976)

MW1102S FH (Plot vs. Predicted Curve)



SLUG TEST DATA FORM

PROJECT INFORMATION				ILLUSTRATION OF INFORMATION							
Project Name		Lockformer Lisle, IL		Well ID		MW-1102S					
Project No.		15-65263.01-001		Test Date		5/29/2003					
Field Personnel		D. Lamsma, K. Woloszyn		Confined							
EQUIPMENT INFORMATION				ILLUSTRATION OF INFORMATION							
Data Logger Type / Model No.		In-Situ									
Transducer Type / Model No.		Minitroll #5914									
Slug Length / Volume		2 feet / 0.18 gallons									
GENERAL INFORMATION				ILLUSTRATION OF INFORMATION							
Static Groundwater Elevation		653.74 ft MSL									
Ground Surface Elevation		698.0 ft MSL									
Top of Casing Elevation		700.52 ft MSL									
Well Stick-up		2.5	ft					76.8	cm		
Depth to Water		46.78	ft					1425.9	cm		
Diameter of Well Casing		2	in					5.1	cm		
Diameter of Borehole at Screen		8	in					20.3	cm		
Screen Interval		41.0 - 51.0	ft BG					1250 - 1554	cm BG		
Screen Length		10	ft					304.8	cm		
Base of Boring		51	ft BG					1554.5	cm BG		
Base of Upper Confining Unit		47	ft BG					1432.6	cm BG		
Top of Lower Confining Unit		38	ft BG					1158.2	cm BG		
Saturated Thickness (b)		3	ft	91.4	cm						
Static Height of Water in Well		6.47	ft	197.2	cm						
Geology of Aquifer		Sand									
SLUG TEST MEASUREMENT INFORMATION											
Parameter		Falling Head			Rising Head						
Initial Water Level Above Transducer		5	ft	152.4	cm			5	ft	152.4	cm
Initial Drawdown/Recovery		1.39	ft	42.44	cm			1.10	ft	33.56	cm
SLUG TEST RESULTS											
Falling H	Rising H	Analysis Method		Parameter				Calculated Value and Units			
Notes:											

In-Situ Inc. MiniTroll Pro

Report generated: 5/29/2003 16:39:26
 Report from file: ...\\SN05914 2003-05-29 100648 MW1102S FH.bin
 Win-Situ Version 4.41

Serial number: 5914
 Firmware Version 3.07
 Unit name: MiniTROLL

Test name: MW1102S FH

Test defined on: 5/29/2003 10:06:16
 Test started on: 5/29/2003 10:06:48
 Test stopped on: 5/29/2003 10:10:53
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing
 Maximum time between data points: 600.0 Seconds.
 Number of data samples: 85

TOTAL DATA SAMPLES 85

Channel number [1]
 Measurement type: Temperature
 Channel name: Temperature

Channel number [2]
 Measurement type: Pressure
 Channel name: Pressure
 Sensor Range: 30 PSIG.
 Specific gravity: 1
 Mode: Surface
 User-defined reference: 0 Feet H2O
 Referenced on: test start
 Pressure head at reference: 6.148 Feet H2O

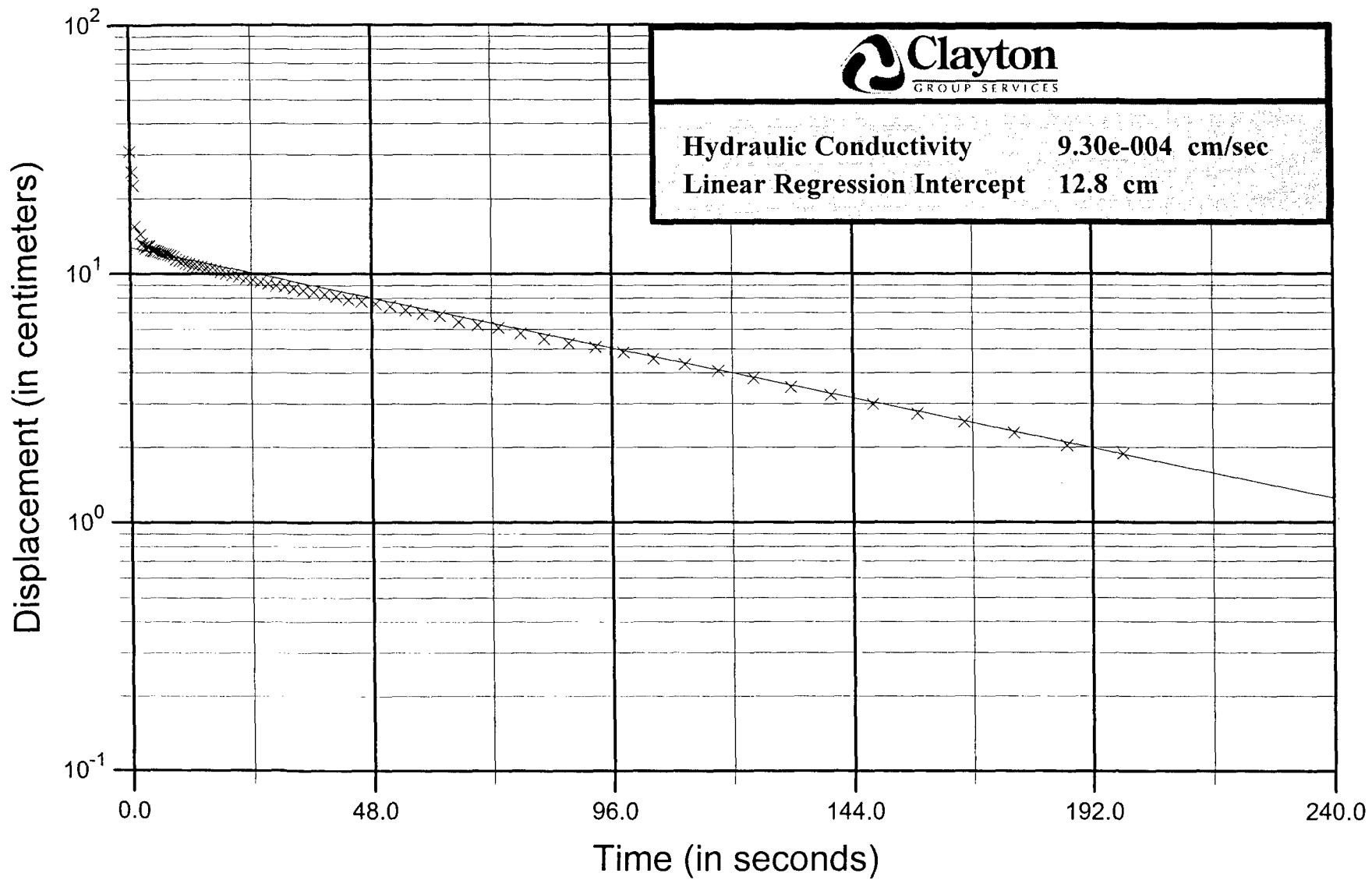
Slug Size: 2 ft x 1.5 in
Depth to water (bgs)=44.26'
Screen length (amount exposed to aquifer)=5.74'
Aquifer thickness=5.74'
Top of screen (water above screen)=0'

Date	Time	ET (sec)	Chan[1] Fahrenheit	Chan[2] Feet H2O	Time (sec)	Head (cm)
5/29/2003	10:06:48	0	53.66	0	-0.9	0.00
5/29/2003	10:06:49	0.3	53.69	0.664	-0.6	20.24
5/29/2003	10:06:49	0.6	53.71	2.56	-0.3	78.03
5/29/2003	10:06:49	0.9	53.71	1.294	0.0	39.44
5/29/2003	10:06:50	1.2	53.73	1.104	0.3	33.65
5/29/2003	10:06:50	1.5	53.73	0.52		

Date	Time	ET (sec)	Chan[1]	Chan[2]	Time (sec)	Head (cm)
			Fahrenheit	Feet H2O		
5/29/2003	10:06:50	1.8	53.73	-0.08		
5/29/2003	10:06:51	2.1	53.73	-0.059		
5/29/2003	10:06:51	2.4	53.73	1.461		
5/29/2003	10:06:51	2.7	53.73	0.393	1.8	11.98
5/29/2003	10:06:51	3	53.73	0.091		
5/29/2003	10:06:52	3.3	53.73	0.307		
5/29/2003	10:06:52	3.6	53.73	0.365	2.7	11.13
5/29/2003	10:06:52	3.9	53.73	0.334	3.0	10.18
5/29/2003	10:06:53	4.2	53.73	0.311	3.3	9.48
5/29/2003	10:06:53	4.5	53.73	0.315	3.6	9.60
5/29/2003	10:06:53	4.8	53.73	0.311	3.9	9.48
5/29/2003	10:06:54	5.1	53.73	0.309	4.2	9.42
5/29/2003	10:06:54	5.4	53.73	0.307	4.5	9.36
5/29/2003	10:06:54	5.7	53.73	0.303	4.8	9.24
5/29/2003	10:06:54	6	53.73	0.299	5.1	9.11
5/29/2003	10:06:55	6.4	53.73	0.293	5.5	8.93
5/29/2003	10:06:55	6.7	53.73	0.293	5.8	8.93
5/29/2003	10:06:56	7.1	53.73	0.292	6.2	8.90
5/29/2003	10:06:56	7.5	53.73	0.284	6.6	8.66
5/29/2003	10:06:56	8	53.73	0.282	7.1	8.60
5/29/2003	10:06:57	8.4	53.73	0.278	7.5	8.47
5/29/2003	10:06:57	8.9	53.73	0.274	8.0	8.35
5/29/2003	10:06:58	9.5	53.73	0.27	8.6	8.23
5/29/2003	10:06:59	10	53.73	0.257	9.1	7.83
5/29/2003	10:06:59	10.6	53.73	0.253	9.7	7.71
5/29/2003	10:07:00	11.3	53.73	0.247	10.4	7.53
5/29/2003	10:07:00	11.9	53.71	0.24	11.0	7.32
5/29/2003	10:07:01	12.6	53.71	0.236	11.7	7.19
5/29/2003	10:07:02	13.4	53.71	0.23	12.5	7.01
5/29/2003	10:07:03	14.2	53.71	0.224	13.3	6.83
5/29/2003	10:07:03	15	53.71	0.221	14.1	6.74
5/29/2003	10:07:04	15.9	53.71	0.213	15.0	6.49
5/29/2003	10:07:05	16.8	53.71	0.209	15.9	6.37
5/29/2003	10:07:06	17.8	53.71	0.205	16.9	6.25
5/29/2003	10:07:07	18.9	53.71	0.199	18.0	6.07
5/29/2003	10:07:08	20	53.71	0.194	19.1	5.91
5/29/2003	10:07:10	21.2	53.71	0.184	20.3	5.61
5/29/2003	10:07:11	22.4	53.71	0.182	21.5	5.55
5/29/2003	10:07:12	23.8	53.71	0.176	22.9	5.36
5/29/2003	10:07:14	25.2	53.71	0.173	24.3	5.27
5/29/2003	10:07:15	26.7	53.71	0.167	25.8	5.09
5/29/2003	10:07:17	28.2	53.71	0.161	27.3	4.91
5/29/2003	10:07:18	29.8	53.71	0.157	28.9	4.79
5/29/2003	10:07:20	31.5	53.71	0.149	30.6	4.54
5/29/2003	10:07:22	33.3	53.71	0.148	32.4	4.51
5/29/2003	10:07:24	35.2	53.71	0.14	34.3	4.27
5/29/2003	10:07:26	37.3	53.71	0.134	36.4	4.08
5/29/2003	10:07:28	39.5	53.71	0.13	38.6	3.96
5/29/2003	10:07:30	41.8	53.71	0.124	40.9	3.78

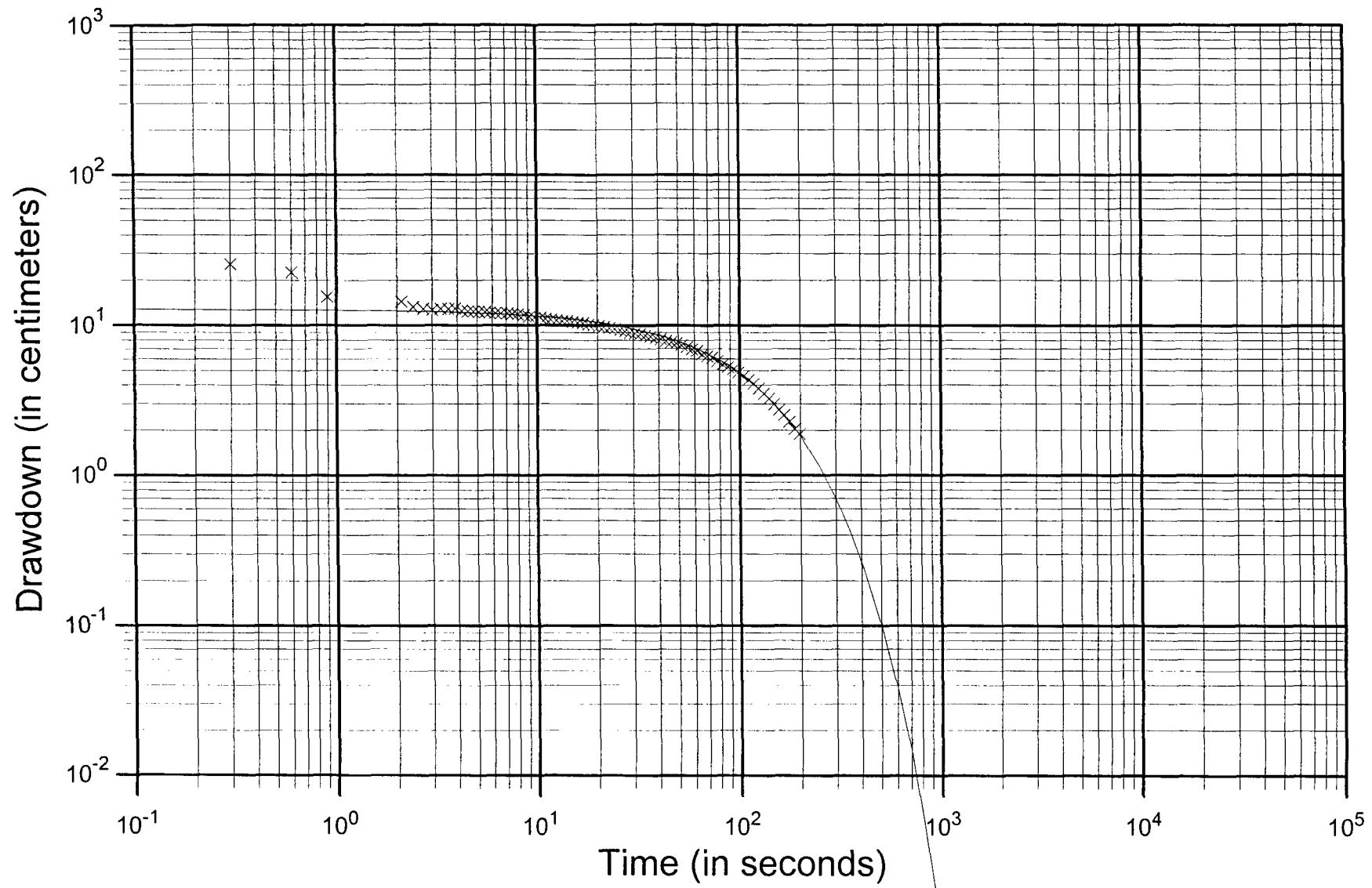
Date	Time	ET (sec)	Chan[1]	Chan[2]	Time (sec)	Head (cm)
			Fahrenheit	Feet H2O		
5/29/2003	10:07:33	44.3	53.69	0.119	43.4	3.63
5/29/2003	10:07:35	46.9	53.71	0.113	46.0	3.44
5/29/2003	10:07:38	49.7	53.69	0.109	48.8	3.32
5/29/2003	10:07:41	52.6	53.69	0.104	51.7	3.17
5/29/2003	10:07:44	55.7	53.69	0.1	54.8	3.05
5/29/2003	10:07:47	59	53.69	0.096	58.1	2.93
5/29/2003	10:07:51	62.5	53.69	0.09	61.6	2.74
5/29/2003	10:07:55	66.2	53.69	0.086	65.3	2.62
5/29/2003	10:07:59	70.1	53.69	0.082	69.2	2.50
5/29/2003	10:08:03	74.3	53.69	0.08	73.4	2.44
5/29/2003	10:08:07	78.7	53.66	0.077	77.8	2.35
5/29/2003	10:08:12	83.4	53.66	0.073	82.5	2.23
5/29/2003	10:08:17	88.4	53.66	0.065	87.5	1.98
5/29/2003	10:08:22	93.7	53.66	0.065	92.8	1.98
5/29/2003	10:08:28	99.3	53.66	0.064	98.4	1.95
5/29/2003	10:08:34	105.2	53.66	0.058	104.3	1.77
5/29/2003	10:08:40	111.5	53.66	0.054	110.6	1.65
5/29/2003	10:08:47	118.1	53.66	0.05	117.2	1.52
5/29/2003	10:08:54	125.1	53.64	0.05	124.2	1.52
5/29/2003	10:09:01	132.6	53.64	0.047	131.7	1.43
5/29/2003	10:09:09	140.5	53.64	0.045	139.6	1.37
5/29/2003	10:09:17	148.9	53.64	0.041	148.0	1.25
5/29/2003	10:09:26	157.8	53.64	0.039	156.9	1.19
5/29/2003	10:09:36	167.2	53.64	0.037	166.3	1.13
5/29/2003	10:09:46	177.2	53.64	0.033	176.3	1.01
5/29/2003	10:09:56	187.8	53.62	0.031	186.9	0.94
5/29/2003	10:10:07	199	53.62	0.03	198.1	0.91
5/29/2003	10:10:19	210.9	53.62	0.028	210.0	0.85
5/29/2003	10:10:32	223.5	53.62	0.026	222.6	0.79
5/29/2003	10:10:45	236.8	53.62	0.026	235.9	0.79

MW1103S Falling Head Slug Test

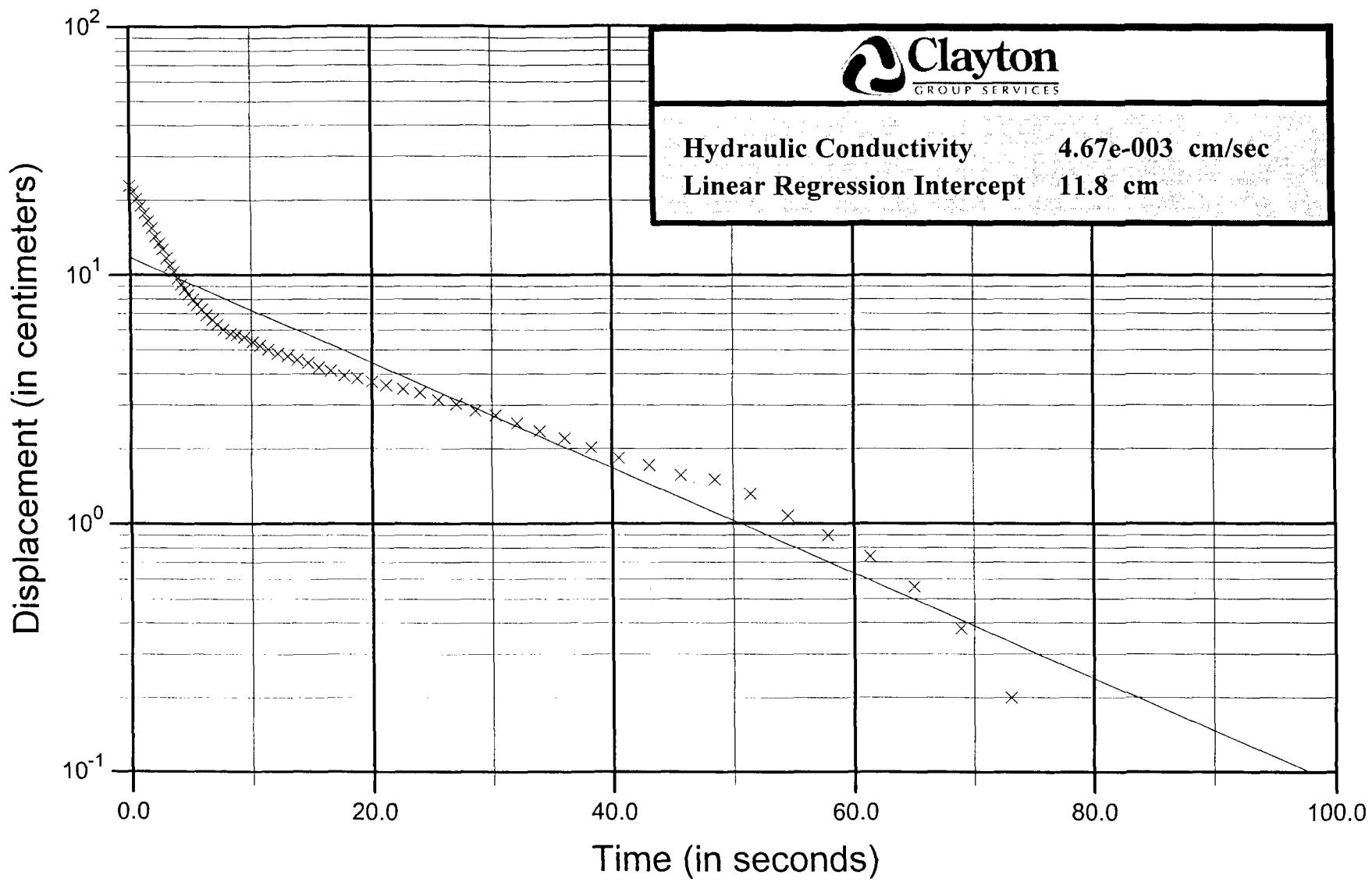


Bouwer and Rice Method (1976)

MW1103S FH (Plot vs. Predicted Curve)

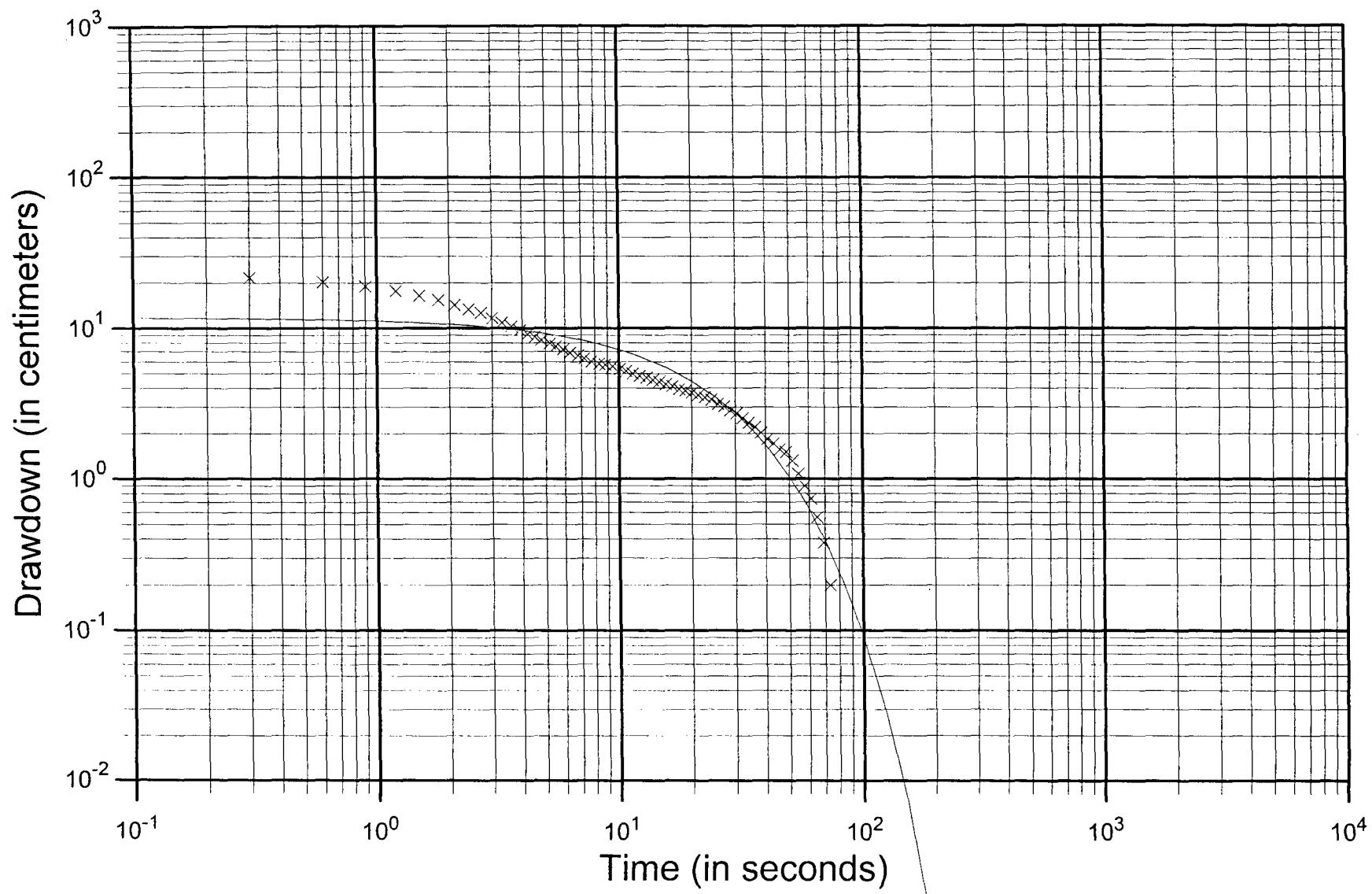


MW1103S Rising Head Slug Test



Bouwer and Rice Method (1976)

MW1103S RH (Plot vs. Predicted Curve)



SLUG TEST DATA FORM

PROJECT INFORMATION				
Project Name	Lockformer Lisle, IL			
Project No.	15-65263.01-001			
Field Personnel	D. Lamsma, D. Frielings			
EQUIPMENT INFORMATION				
Data Logger Type / Model No.	In-Situ			
Transducer Type / Model No.	Minitroll #5914			
Slug Length / Volume	2 feet / 0.18 gallons			
GENERAL INFORMATION				
Static Groundwater Elevation	653.72	ft MSL		
Ground Surface Elevation	694.2	ft MSL		
Top of Casing Elevation	696.85	ft MSL		
Well Stick-up	2.65	ft	80.8	cm
Depth to Water	43.13	ft	1314.6	cm
Diameter of Well Casing	2	in	5.1	cm
Diameter of Borehole at Screen	8	in	20.3	cm
Screen Interval	36.0 - 46.0	ft BG	1097 - 1402	cm BG
Screen Length	10	ft	304.8	cm
Base of Boring	46	ft BG	1402.1	cm BG
Base of Upper Confining Unit	---	ft BG	0.0	cm BG
Top of Lower Confining Unit	---	ft BG	0.0	cm BG
Saturated Thickness (b)	7	ft	213.4	cm
Static Height of Water in Well	4.79	ft	146.0	cm
Geology of Aquifer	Sand			
SLUG TEST MEASUREMENT INFORMATION				
Parameter	Falling Head			Rising Head
Initial Water Level Above Transducer	3	ft	91.44	cm
Initial Drawdown/Recovery	1.01	ft	30.85	cm
SLUG TEST RESULTS				
Falling H	Rising H	Analysis Method	Parameter	Calculated Value and Units
Notes:				

In-Situ Inc. MiniTroll Pro

Report generated: 5/28/2003 16:44:29
 Report from file: ...\\SN05914 2003-05-28 100347 MW1103S FH .bin
 Win-Situ Version 4.41

Serial number: 5914
 Firmware Version 3.07
 Unit name: MiniTROLL

Test name: MW1103S FH

Test defined on: 5/28/2003 9:56:32
 Test started on: 5/28/2003 10:03:47
 Test stopped on: 5/28/2003 10:07:16
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing
 Maximum time between data points: 600.0 Seconds.
 Number of data samples: 82

TOTAL DATA SAMPLES 82

Channel number [1]
 Measurement type: Temperature
 Channel name: Temperature

Channel number [2]
 Measurement type: Pressure
 Channel name: Pressure
 Sensor Range: 30 PSIG.
 Specific gravity: 1
 Mode: Surface
 User-defined reference: 0 Feet H2O
 Referenced on: test start
 Pressure head at reference: 4.479 Feet H2O

Slug Size: 2 ft x 1.5 in
Depth to water (bgs)=40.48'
Screen length (amount exposed to aquifer)=3.52'
Aquifer thickness=3.52'
Top of screen (water above screen)=0'

Date	Time	ET (sec)	Fahrenheit	Chan[1]	Chan[2]	Feet H2O	Time (sec)	Head (cm)
5/28/2003	10:03:47	0	53.59	0	-0.9	0.00		
5/28/2003	10:03:47	0.3	53.64	0.113	-0.6	3.44		
5/28/2003	10:03:47	0.6	53.64	0.584	-0.3	17.80		
5/28/2003	10:03:48	0.9	53.64	1.012	0.0	30.85		
5/28/2003	10:03:48	1.2	53.64	0.838	0.3	25.54		
5/28/2003	10:03:48	1.5	53.66	0.74	0.6	22.56		

Date	Time	ET (sec)	Chan[1]	Chan[2]	Time (sec)	Head (cm)
			Fahrenheit	Feet H2O		
5/28/2003	10:03:49	1.8	53.66	0.509	0.9	15.51
5/28/2003	10:03:49	2.1	53.66	0.372		
5/28/2003	10:03:49	2.4	53.66	0.263		
5/28/2003	10:03:50	2.7	53.66	0.353		
5/28/2003	10:03:50	3	53.66	0.474	2.1	14.45
5/28/2003	10:03:50	3.3	53.66	0.436	2.4	13.29
5/28/2003	10:03:50	3.6	53.66	0.424	2.7	12.92
5/28/2003	10:03:51	3.9	53.66	0.415	3.0	12.65
5/28/2003	10:03:51	4.2	53.66	0.424	3.3	12.92
5/28/2003	10:03:51	4.5	53.66	0.422	3.6	12.86
5/28/2003	10:03:52	4.8	53.66	0.426	3.9	12.98
5/28/2003	10:03:52	5.1	53.66	0.411	4.2	12.53
5/28/2003	10:03:52	5.4	53.66	0.407	4.5	12.41
5/28/2003	10:03:53	5.7	53.66	0.407	4.8	12.41
5/28/2003	10:03:53	6	53.66	0.405	5.1	12.34
5/28/2003	10:03:53	6.4	53.66	0.403	5.5	12.28
5/28/2003	10:03:54	6.7	53.66	0.399	5.8	12.16
5/28/2003	10:03:54	7.1	53.66	0.397	6.2	12.10
5/28/2003	10:03:54	7.5	53.69	0.395	6.6	12.04
5/28/2003	10:03:55	8	53.69	0.395	7.1	12.04
5/28/2003	10:03:55	8.4	53.66	0.392	7.5	11.95
5/28/2003	10:03:56	8.9	53.69	0.389	8.0	11.86
5/28/2003	10:03:56	9.5	53.69	0.386	8.6	11.77
5/28/2003	10:03:57	10	53.66	0.376	9.1	11.46
5/28/2003	10:03:57	10.6	53.66	0.37	9.7	11.28
5/28/2003	10:03:58	11.3	53.66	0.369	10.4	11.25
5/28/2003	10:03:59	11.9	53.66	0.363	11.0	11.06
5/28/2003	10:03:59	12.6	53.66	0.359	11.7	10.94
5/28/2003	10:04:00	13.4	53.66	0.355	12.5	10.82
5/28/2003	10:04:01	14.2	53.66	0.351	13.3	10.70
5/28/2003	10:04:02	15	53.66	0.351	14.1	10.70
5/28/2003	10:04:03	15.9	53.66	0.345	15.0	10.52
5/28/2003	10:04:04	16.8	53.64	0.342	15.9	10.42
5/28/2003	10:04:05	17.8	53.64	0.34	16.9	10.36
5/28/2003	10:04:06	18.9	53.66	0.334	18.0	10.18
5/28/2003	10:04:07	20	53.66	0.33	19.1	10.06
5/28/2003	10:04:08	21.2	53.64	0.325	20.3	9.91
5/28/2003	10:04:09	22.4	53.66	0.32	21.5	9.75
5/28/2003	10:04:11	23.8	53.66	0.315	22.9	9.60
5/28/2003	10:04:12	25.2	53.66	0.311	24.3	9.48
5/28/2003	10:04:14	26.7	53.66	0.305	25.8	9.30
5/28/2003	10:04:15	28.2	53.66	0.301	27.3	9.17
5/28/2003	10:04:17	29.8	53.66	0.295	28.9	8.99
5/28/2003	10:04:18	31.5	53.66	0.292	30.6	8.90
5/28/2003	10:04:20	33.3	53.66	0.288	32.4	8.78
5/28/2003	10:04:22	35.2	53.64	0.282	34.3	8.60
5/28/2003	10:04:24	37.3	53.66	0.278	36.4	8.47
5/28/2003	10:04:26	39.5	53.66	0.272	38.6	8.29
5/28/2003	10:04:29	41.8	53.66	0.267	40.9	8.14

Date	Time	ET (sec)	Chan[1]	Chan[2]	Time (sec)	Head (cm)
			Fahrenheit	Feet H2O		
5/28/2003	10:04:31	44.3	53.64	0.259	43.4	7.89
5/28/2003	10:04:34	46.9	53.64	0.255	46.0	7.77
5/28/2003	10:04:37	49.7	53.64	0.25	48.8	7.62
5/28/2003	10:04:39	52.6	53.64	0.244	51.7	7.44
5/28/2003	10:04:43	55.7	53.64	0.236	54.8	7.19
5/28/2003	10:04:46	59	53.64	0.228	58.1	6.95
5/28/2003	10:04:49	62.5	53.64	0.223	61.6	6.80
5/28/2003	10:04:53	66.2	53.64	0.211	65.3	6.43
5/28/2003	10:04:57	70.1	53.64	0.205	69.2	6.25
5/28/2003	10:05:01	74.3	53.64	0.2	73.4	6.10
5/28/2003	10:05:06	78.7	53.64	0.19	77.8	5.79
5/28/2003	10:05:10	83.4	53.64	0.18	82.5	5.49
5/28/2003	10:05:15	88.4	53.64	0.173	87.5	5.27
5/28/2003	10:05:21	93.7	53.62	0.167	92.8	5.09
5/28/2003	10:05:26	99.3	53.62	0.159	98.4	4.85
5/28/2003	10:05:32	105.2	53.62	0.15	104.3	4.57
5/28/2003	10:05:38	111.5	53.62	0.142	110.6	4.33
5/28/2003	10:05:45	118.1	53.62	0.134	117.2	4.08
5/28/2003	10:05:52	125.1	53.62	0.125	124.2	3.81
5/28/2003	10:05:59	132.6	53.62	0.115	131.7	3.51
5/28/2003	10:06:07	140.5	53.62	0.107	139.6	3.26
5/28/2003	10:06:16	148.9	53.59	0.098	148.0	2.99
5/28/2003	10:06:25	157.8	53.59	0.09	156.9	2.74
5/28/2003	10:06:34	167.2	53.59	0.083	166.3	2.53
5/28/2003	10:06:44	177.2	53.59	0.075	176.3	2.29
5/28/2003	10:06:55	187.8	53.59	0.067	186.9	2.04
5/28/2003	10:07:06	199	53.59	0.062	198.1	1.89

In-Situ Inc.

MiniTroll Pro

Report generated:

5/28/2003 16:45:42

Report from file:

...\SN05914 2003-05-28 101100 MW1103S RH.bin

Win-Situ Version

4.41

Serial number:

5914

Firmware Version

3.07

Unit name:

MiniTROLL

Test name:

MW1103S RH

Test defined on: 5/28/2003 10:08:16

Test started on: 5/28/2003 10:11:00

Test stopped on: 5/28/2003 10:12:18

Test extracted on: N/A N/A

Data gathered using Logarithmic testing

Maximum time between data points: 600.0 Seconds.

Number of data samples: 65

TOTAL DATA SAMPLES 65

Channel number [1]

Measurement type:

Channel name:

Channel number [2]

Measurement type:

Channel name:

Sensor Range: 30 PSIG.

Specific gravity: 1

Mode: TOC

User-defined reference: 0 Feet H2O

Referenced on: test start

Pressure head at reference: 4.225 Feet H2O

Slug Size: 2 ft x 1.5 in

Depth to water (bgs)=40.48'

Screen length (amount exposed to aquifer)=3.52'

Aquifer thickness=3.52'

Top of screen (water above screen)=0'

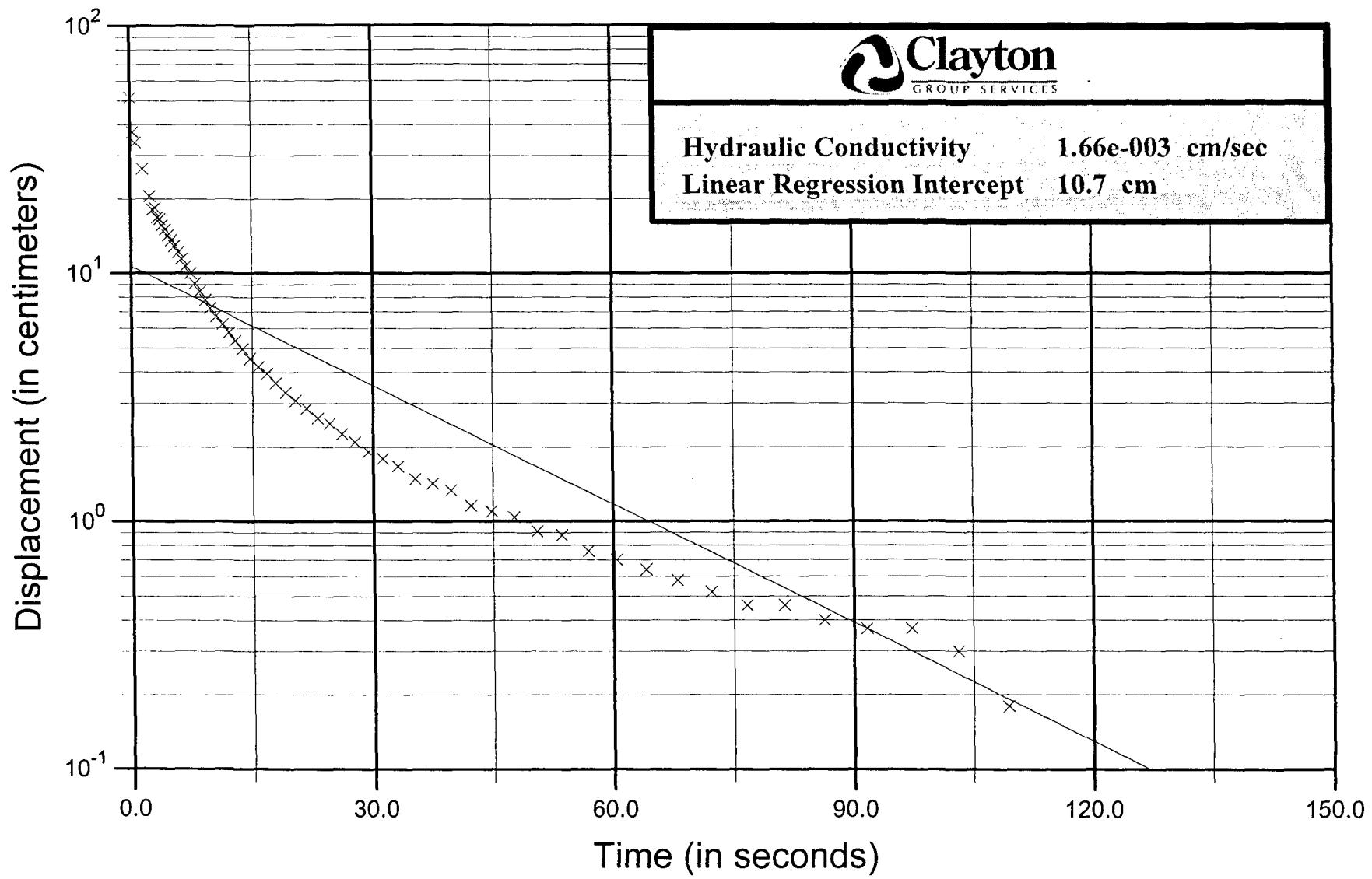
Date	Time	ET (sec)	Chan[1]	Chan[2]	Time (sec)	Head (cm)
			Fahrenheit	Feet H2O		
5/28/2003	10:11:00	0	53.55	0	-1.2	0.00
5/28/2003	10:11:00	0.3	53.57	0.066	-0.9	2.01
5/28/2003	10:11:00	0.6	53.59	0.16	-0.6	4.88
5/28/2003	10:11:00	0.9	53.59	0.541	-0.3	16.49
5/28/2003	10:11:01	1.2	53.59	0.655	0.0	19.96
5/28/2003	10:11:01	1.5	53.59	0.613	0.3	18.68

NOT enough displacement and the values
range from positive to negative. Data not
usable

Date	Time	ET (sec)	Chan[1]		Chan[2]	
			Fahrenheit	Feet H2O	Time (sec)	Head (cm)
5/28/2003	10:11:01	1.8	53.62	0.567	0.6	17.28
5/28/2003	10:11:02	2.1	53.62	0.524	0.9	15.97
5/28/2003	10:11:02	2.4	53.59	0.484	1.2	14.75
5/28/2003	10:11:02	2.7	53.62	0.444	1.5	13.53
5/28/2003	10:11:03	3	53.62	0.409	1.8	12.47
5/28/2003	10:11:03	3.3	53.62	0.371	2.1	11.31
5/28/2003	10:11:03	3.6	53.62	0.342	2.4	10.42
5/28/2003	10:11:03	3.9	53.62	0.319	2.7	9.72
5/28/2003	10:11:04	4.2	53.62	0.286	3.0	8.72
5/28/2003	10:11:04	4.5	53.62	0.261	3.3	7.96
5/28/2003	10:11:04	4.8	53.62	0.24	3.6	7.32
5/28/2003	10:11:05	5.1	53.62	0.22	3.9	6.71
5/28/2003	10:11:05	5.4	53.62	0.203	4.2	6.19
5/28/2003	10:11:05	5.7	53.62	0.19	4.5	5.79
5/28/2003	10:11:06	6	53.62	0.176	4.8	5.36
5/28/2003	10:11:06	6.4	53.62	0.163	5.2	4.97
5/28/2003	10:11:06	6.7	53.62	0.151	5.5	4.60
5/28/2003	10:11:07	7.1	53.62	0.14	5.9	4.27
5/28/2003	10:11:07	7.5	53.62	0.128	6.3	3.90
5/28/2003	10:11:07	8	53.62	0.118	6.8	3.60
5/28/2003	10:11:08	8.4	53.62	0.109	7.2	3.32
5/28/2003	10:11:08	8.9	53.64	0.099	7.7	3.02
5/28/2003	10:11:09	9.5	53.64	0.092	8.3	2.80
5/28/2003	10:11:10	10	53.62	0.09	8.8	2.74
5/28/2003	10:11:10	10.6	53.62	0.086	9.4	2.62
5/28/2003	10:11:11	11.3	53.59	0.078	10.1	2.38
5/28/2003	10:11:11	11.9	53.62	0.072	10.7	2.19
5/28/2003	10:11:12	12.6	53.62	0.066	11.4	2.01
5/28/2003	10:11:13	13.4	53.59	0.06	12.2	1.83
5/28/2003	10:11:14	14.2	53.59	0.056	13.0	1.71
5/28/2003	10:11:14	15	53.59	0.051	13.8	1.55
5/28/2003	10:11:15	15.9	53.62	0.047	14.7	1.43
5/28/2003	10:11:16	16.8	53.59	0.041	15.6	1.25
5/28/2003	10:11:17	17.8	53.59	0.037	16.6	1.13
5/28/2003	10:11:18	18.9	53.59	0.031	17.7	0.94
5/28/2003	10:11:20	20	53.62	0.028	18.8	0.85
5/28/2003	10:11:21	21.2	53.62	0.024	20.0	0.73
5/28/2003	10:11:22	22.4	53.59	0.02	21.2	0.61
5/28/2003	10:11:23	23.8	53.59	0.016	22.6	0.49
5/28/2003	10:11:25	25.2	53.59	0.012	24.0	0.37
5/28/2003	10:11:26	26.7	53.59	0.005	25.5	0.15
5/28/2003	10:11:28	28.2	53.59	0.001	27.0	0.03
5/28/2003	10:11:29	29.8	53.59	-0.005	28.6	-0.15
5/28/2003	10:11:31	31.5	53.59	-0.009	30.3	-0.27
5/28/2003	10:11:33	33.3	53.59	-0.015	32.1	-0.46
5/28/2003	10:11:35	35.2	53.59	-0.021	34.0	-0.64
5/28/2003	10:11:37	37.3	53.59	-0.026	36.1	-0.79
5/28/2003	10:11:39	39.5	53.59	-0.032	38.3	-0.98
5/28/2003	10:11:41	41.8	53.59	-0.038	40.6	-1.16

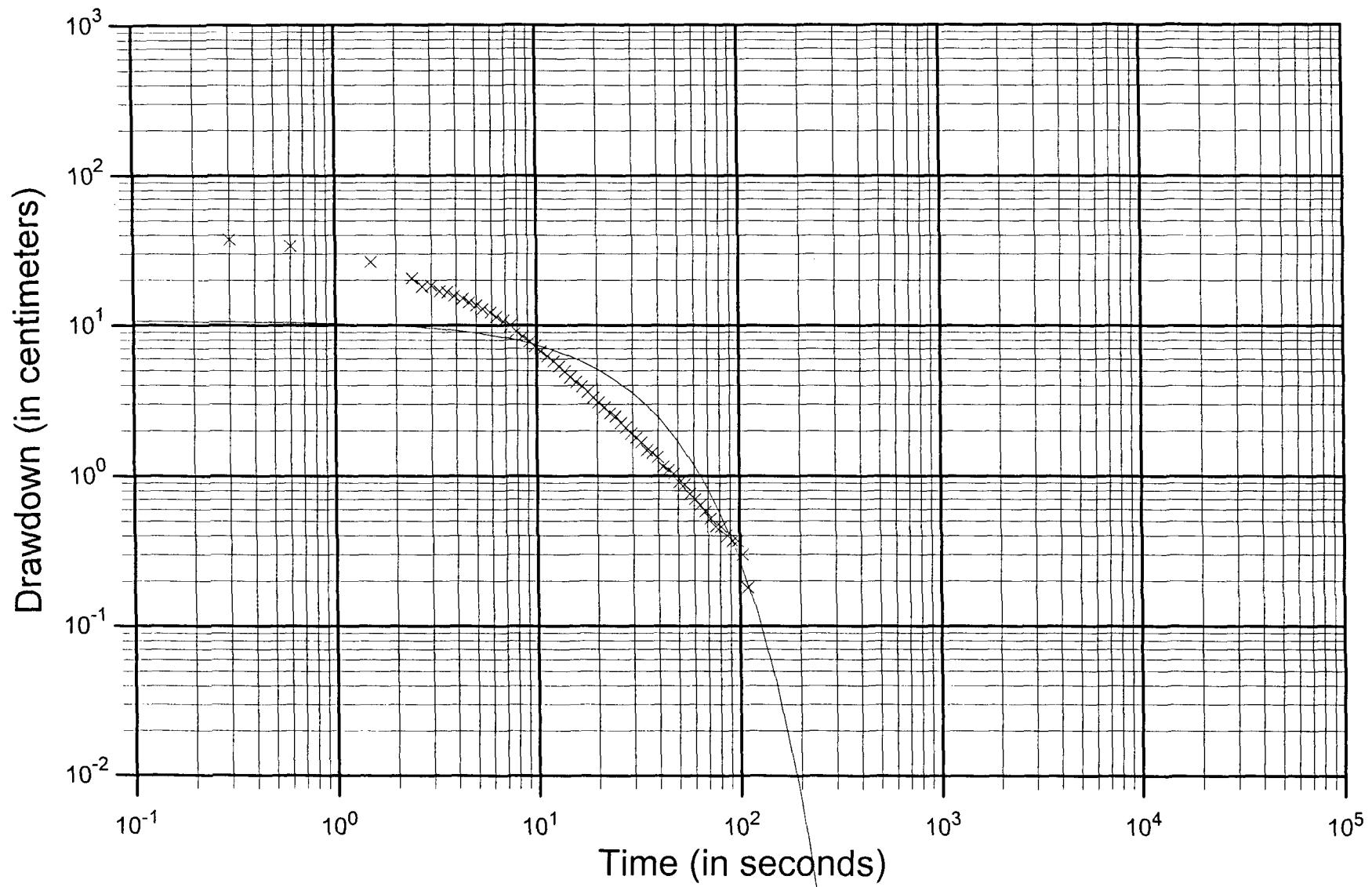
Date	Time	ET (sec)	Chan[1]		Chan[2]	
			Fahrenheit	Feet H2O	Time (sec)	Head (cm)
5/28/2003	10:11:44	44.3	53.59	-0.042	43.1	-1.28
5/28/2003	10:11:46	46.9	53.59	-0.047	45.7	-1.43
5/28/2003	10:11:49	49.7	53.59	-0.049	48.5	-1.49
5/28/2003	10:11:52	52.6	53.59	-0.055	51.4	-1.68
5/28/2003	10:11:55	55.7	53.59	-0.063	54.5	-1.92
5/28/2003	10:11:58	59	53.59	-0.069	57.8	-2.10
5/28/2003	10:12:02	62.5	53.59	-0.074	61.3	-2.26
5/28/2003	10:12:06	66.2	53.59	-0.08	65.0	-2.44
5/28/2003	10:12:10	70.1	53.59	-0.086	68.9	-2.62
5/28/2003	10:12:14	74.3	53.59	-0.092	73.1	-2.80

MW1109 Falling Head Slug Test

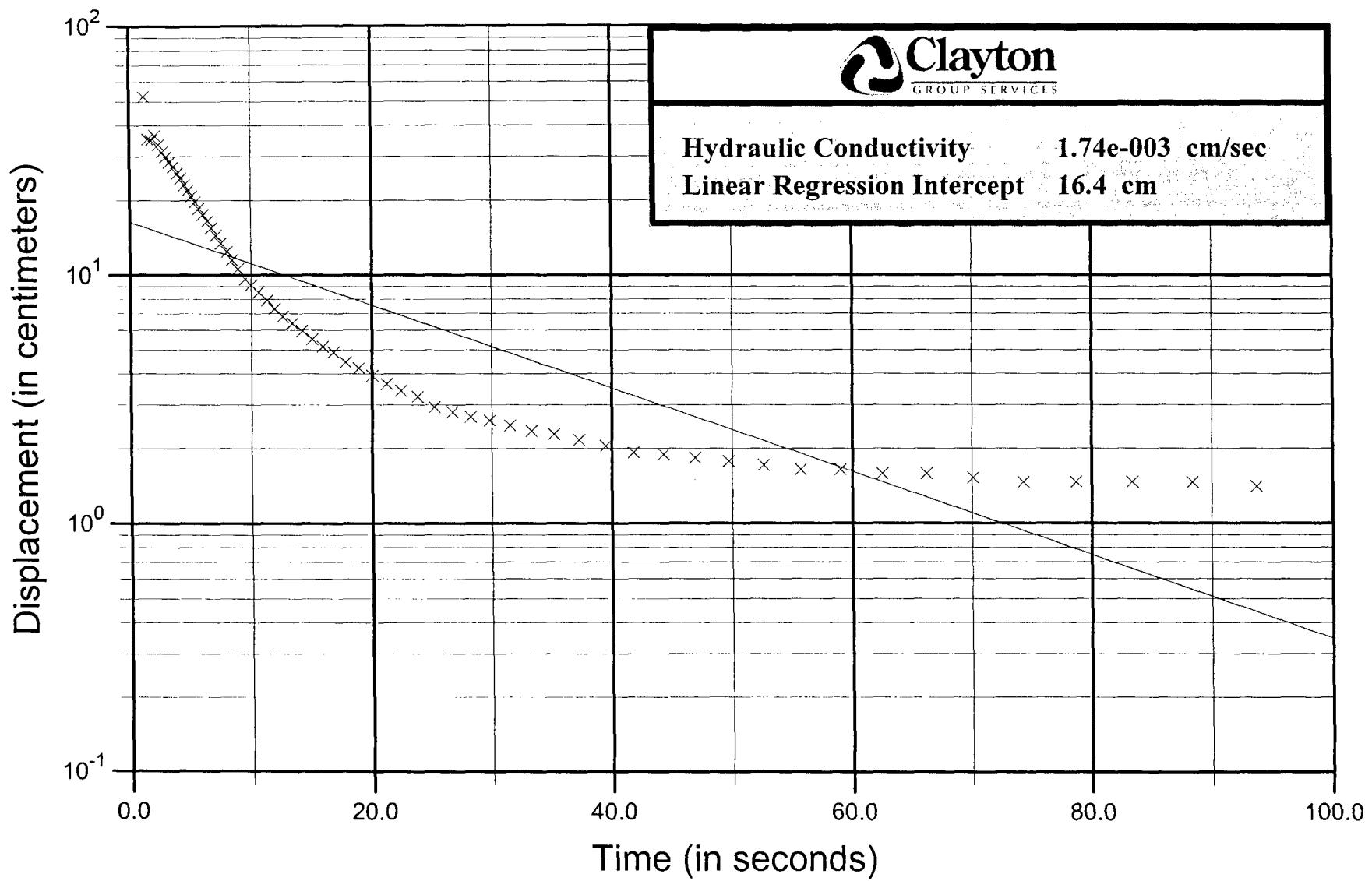


Bouwer and Rice Method (1976)

MW1109 FH (Plot vs. Predicted Curve)

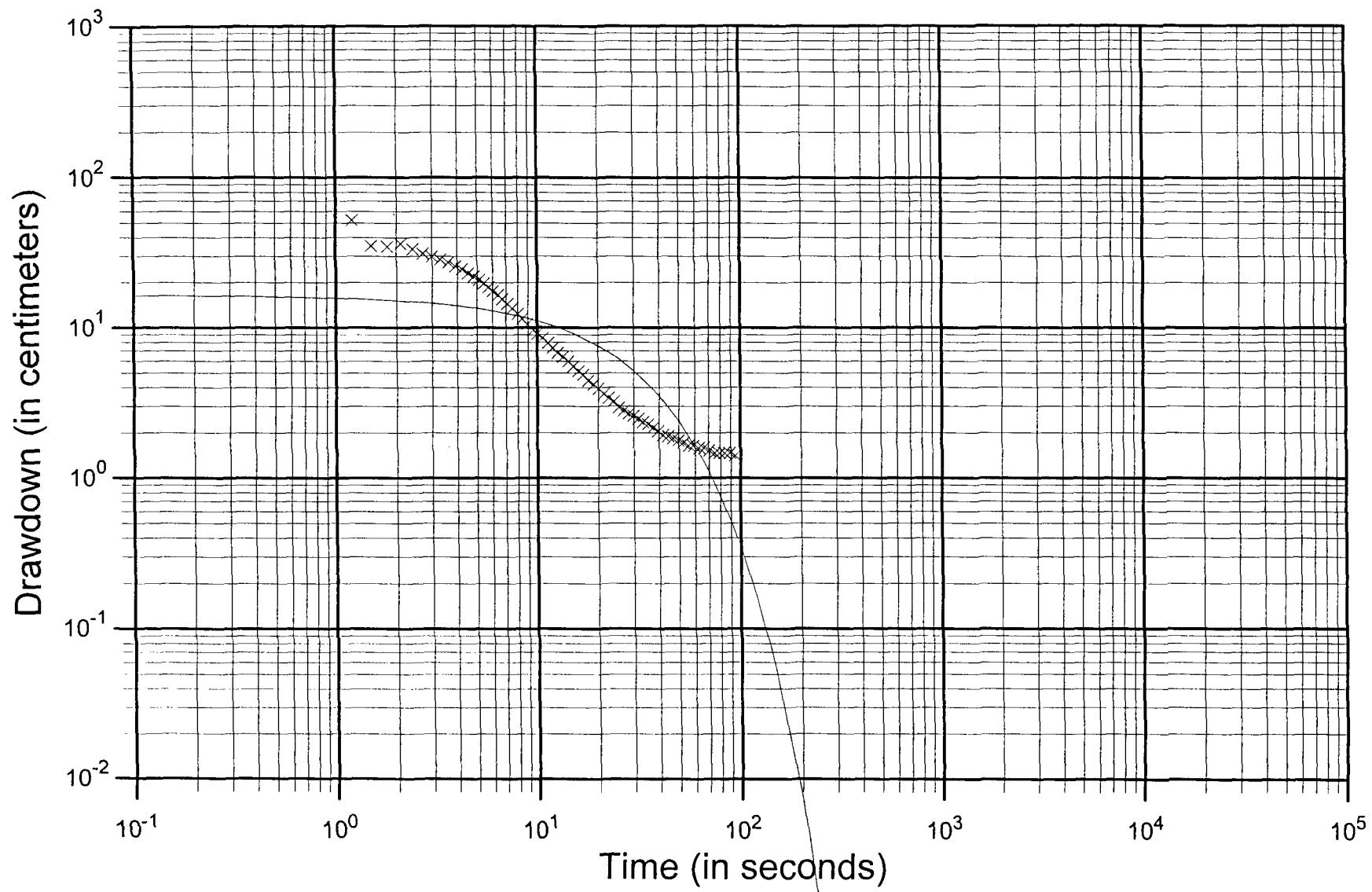


MW1109 Rising Head Slug Test



Bouwer and Rice Method (1976)

MW1109 RH (Plot vs. Predicted Curve)



SLUG TEST DATA FORM

PROJECT INFORMATION							
Project Name				Lockformer Lisle, IL		Well ID	MW-1109
Project No.				15-65263.01-001		Test Date	5/29/2003
Field Personnel				D. Lamsma, K. Woloszyn			Unconfined
EQUIPMENT INFORMATION				ILLUSTRATION OF INFORMATION			
Data Logger Type / Model No.				In-Situ			
Transducer Type / Model No.				Minitroll #5914			
Slug Length / Volume				3 feet / 0.28 gallons			
GENERAL INFORMATION							
Static Groundwater Elevation		653.91		ft MSL			
Ground Surface Elevation		698.6		ft MSL			
Top of Casing Elevation		701.04		ft MSL			
Well Stick-up		2.44	ft	74.4	cm		
Depth to Water		47.13	ft	1436.5	cm		
Diameter of Well Casing		2	in	5.1	cm		
Diameter of Borehole at Screen		8	in	20.3	cm		
Screen Interval		44.5 - 54.5	ft BG	1356 - 1661	cm BG		
Screen Length		10	ft	304.8	cm		
Base of Boring		55	ft BG	1676.4	cm BG		
Base of Upper Confining Unit		---	ft BG	0.0	cm BG		
Top of Lower Confining Unit		---	ft BG	0.0	cm BG		
Saturated Thickness (b)		9	ft	274.3	cm		
Static Height of Water in Well		9.68	ft	295.0	cm		
Geology of Aquifer		Sand					
SLUG TEST MEASUREMENT INFORMATION							
Parameter		Falling Head			Rising Head		
Initial Water Level Above Transducer		8	ft	243.84	cm	8	ft
Initial Drawdown/Recovery		1.23	ft	37.49	cm	1.68	ft
SLUG TEST RESULTS							
Falling H	Rising H	Analysis Method		Parameter	Calculated Value and Units		
Notes:							

In-Situ Inc.

MiniTroll Pro

Report generated:

5/29/2003 16:41:09

Report from file:

...\SN05914 2003-05-29 110112 MW1109 FH.bin

Win-Situ Version

4.41

Serial number:

5914

Firmware Version

3.07

Unit name:

MiniTROLL

Test name:

MW1109 FH

Test defined on:

5/29/2003 11:00:20

Test started on:

5/29/2003 11:01:12

Test stopped on:

5/29/2003 11:04:26

Test extracted on:

N/A N/A

Data gathered using Logarithmic testing

Maximum time between data points: 600.0 Seconds.

Number of data samples: 81

TOTAL DATA SAMPLES

81

Channel number [1]

Measurement type: Temperature

Channel name: Temperature

Channel number [2]

Measurement type: Pressure

Channel name: Pressure

Sensor Range: 30 PSIG.

Specific gravity: 1

Mode: Surface

User-defined reference: 0 Feet H2O

Referenced on: test start

Pressure head at reference: 7.911 Feet H2O

Slug Size: 3 ft x 1.5 in

Depth to water (bgs)=44.74'

Screen length (amount exposed to aquifer)=9.68'

Aquifer thickness=9.68'

Top of screen (water above screen)=0'

Date	Time	ET (sec)	Chan[1]	Chan[2]	Fahrenheit	Feet H2O	Time (sec)	Head (cm)
			-----	-----				
5/29/2003	11:01:12	0	53.53	0	-2.1	0.00		
5/29/2003	11:01:12	0.3	53.55	0.015	-1.8	0.46		
5/29/2003	11:01:12	0.6	53.57	0.024	-1.5	0.73		
5/29/2003	11:01:12	0.9	53.57	0.044	-1.2	1.34		
5/29/2003	11:01:13	1.2	53.57	4.507	-0.9	137.37		
5/29/2003	11:01:13	1.5	53.59	3.21	-0.6	97.84		

Date	Time	ET (sec)	Chan[1]	Chan[2]	Fahrenheit	Feet H2O	Time (sec)	Head (cm)
5/29/2003	11:01:13	1.8	53.59	-1.354			-0.3	-41.27
5/29/2003	11:01:14	2.1	53.57	1.69			0.0	51.51
5/29/2003	11:01:14	2.4	53.59	1.23			0.3	37.49
5/29/2003	11:01:14	2.7	53.59	1.113			0.6	33.92
5/29/2003	11:01:15	3	53.59	0.518				
5/29/2003	11:01:15	3.3	53.59	0.476				
5/29/2003	11:01:15	3.6	53.59	0.872			1.5	26.58
5/29/2003	11:01:15	3.9	53.59	0.634				
5/29/2003	11:01:16	4.2	53.59	0.653				
5/29/2003	11:01:16	4.5	53.59	0.676			2.4	20.60
5/29/2003	11:01:16	4.8	53.59	0.595			2.7	18.14
5/29/2003	11:01:17	5.1	53.59	0.605			3.0	18.44
5/29/2003	11:01:17	5.4	53.59	0.553			3.3	16.86
5/29/2003	11:01:17	5.7	53.59	0.545			3.6	16.61
5/29/2003	11:01:18	6	53.59	0.515			3.9	15.70
5/29/2003	11:01:18	6.4	53.59	0.495			4.3	15.09
5/29/2003	11:01:18	6.7	53.59	0.468			4.6	14.26
5/29/2003	11:01:19	7.1	53.59	0.447			5.0	13.62
5/29/2003	11:01:19	7.5	53.59	0.424			5.4	12.92
5/29/2003	11:01:19	8	53.59	0.401			5.9	12.22
5/29/2003	11:01:20	8.4	53.59	0.376			6.3	11.46
5/29/2003	11:01:20	8.9	53.59	0.351			6.8	10.70
5/29/2003	11:01:21	9.5	53.59	0.328			7.4	10.00
5/29/2003	11:01:22	10	53.57	0.299			7.9	9.11
5/29/2003	11:01:22	10.6	53.57	0.278			8.5	8.47
5/29/2003	11:01:23	11.3	53.57	0.257			9.2	7.83
5/29/2003	11:01:23	11.9	53.57	0.238			9.8	7.25
5/29/2003	11:01:24	12.6	53.57	0.221			10.5	6.74
5/29/2003	11:01:25	13.4	53.57	0.205			11.3	6.25
5/29/2003	11:01:26	14.2	53.57	0.19			12.1	5.79
5/29/2003	11:01:26	15	53.57	0.176			12.9	5.36
5/29/2003	11:01:27	15.9	53.57	0.163			13.8	4.97
5/29/2003	11:01:28	16.8	53.57	0.149			14.7	4.54
5/29/2003	11:01:29	17.8	53.57	0.138			15.7	4.21
5/29/2003	11:01:30	18.9	53.57	0.13			16.8	3.96
5/29/2003	11:01:32	20	53.57	0.119			17.9	3.63
5/29/2003	11:01:33	21.2	53.57	0.109			19.1	3.32
5/29/2003	11:01:34	22.4	53.57	0.101			20.3	3.08
5/29/2003	11:01:35	23.8	53.57	0.094			21.7	2.87
5/29/2003	11:01:37	25.2	53.57	0.086			23.1	2.62
5/29/2003	11:01:38	26.7	53.57	0.082			24.6	2.50
5/29/2003	11:01:40	28.2	53.57	0.074			26.1	2.26
5/29/2003	11:01:41	29.8	53.57	0.069			27.7	2.10
5/29/2003	11:01:43	31.5	53.57	0.063			29.4	1.92
5/29/2003	11:01:45	33.3	53.57	0.059			31.2	1.80
5/29/2003	11:01:47	35.2	53.57	0.055			33.1	1.68
5/29/2003	11:01:49	37.3	53.57	0.049			35.2	1.49
5/29/2003	11:01:51	39.5	53.57	0.047			37.4	1.43
5/29/2003	11:01:53	41.8	53.55	0.044			39.7	1.34

Date	Time	ET (sec)	Chan[1]	Chan[2]	Time (sec)	Head (cm)
			Fahrenheit	Feet H2O		
5/29/2003	11:01:56	44.3	53.57	0.038	42.2	1.16
5/29/2003	11:01:58	46.9	53.57	0.036	44.8	1.10
5/29/2003	11:02:01	49.7	53.55	0.034	47.6	1.04
5/29/2003	11:02:04	52.6	53.55	0.03	50.5	0.91
5/29/2003	11:02:07	55.7	53.55	0.029	53.6	0.88
5/29/2003	11:02:10	59	53.55	0.025	56.9	0.76
5/29/2003	11:02:14	62.5	53.55	0.023	60.4	0.70
5/29/2003	11:02:18	66.2	53.55	0.021	64.1	0.64
5/29/2003	11:02:22	70.1	53.55	0.019	68.0	0.58
5/29/2003	11:02:26	74.3	53.55	0.017	72.2	0.52
5/29/2003	11:02:30	78.7	53.53	0.015	76.6	0.46
5/29/2003	11:02:35	83.4	53.53	0.015	81.3	0.46
5/29/2003	11:02:40	88.4	53.53	0.013	86.3	0.40
5/29/2003	11:02:45	93.7	53.53	0.012	91.6	0.37
5/29/2003	11:02:51	99.3	53.53	0.012	97.2	0.37
5/29/2003	11:02:57	105.2	53.53	0.01	103.1	0.30
5/29/2003	11:03:03	111.5	53.53	0.006	109.4	0.18
5/29/2003	11:03:10	118.1	53.53	0.008	116.0	0.24
5/29/2003	11:03:17	125.1	53.53	0.006	123.0	0.18
5/29/2003	11:03:24	132.6	53.53	0.006	130.5	0.18
5/29/2003	11:03:32	140.5	53.5	0.006	138.4	0.18
5/29/2003	11:03:40	148.9	53.5	0.006	146.8	0.18
5/29/2003	11:03:49	157.8	53.5	0.002	155.7	0.06
5/29/2003	11:03:59	167.2	53.5	0.006	165.1	0.18
5/29/2003	11:04:09	177.2	53.5	0.004	175.1	0.12
5/29/2003	11:04:19	187.8	53.5	0.004	185.7	0.12

In-Situ Inc. MiniTroll Pro

Report generated: 5/29/2003 16:42:07
 Report from file: ...\\SN05914 2003-05-29 110732 MW1109 RH.bin
 Win-Situ Version 4.41

Serial number: 5914
 Firmware Version 3.07
 Unit name: MiniTROLL

Test name: MW1109 RH

Test defined on: 5/29/2003 11:07:10
 Test started on: 5/29/2003 11:07:32
 Test stopped on: 5/29/2003 11:10:11
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing
 Maximum time between data points: 600.0 Seconds.
 Number of data samples: 78

NOT enough displacement, the values oscillate, and are mostly negative. Data not usable

TOTAL DATA SAMPLES 78

Channel number [1]
 Measurement type: Temperature
 Channel name: Temperature

Channel number [2]
 Measurement type: Pressure
 Channel name: Pressure
 Sensor Range: 30 PSIG.
 Specific gravity: 1
 Mode: TOC
 User-defined reference: 0 Feet H2O
 Referenced on: test start
 Pressure head at reference: 6.807 Feet H2O

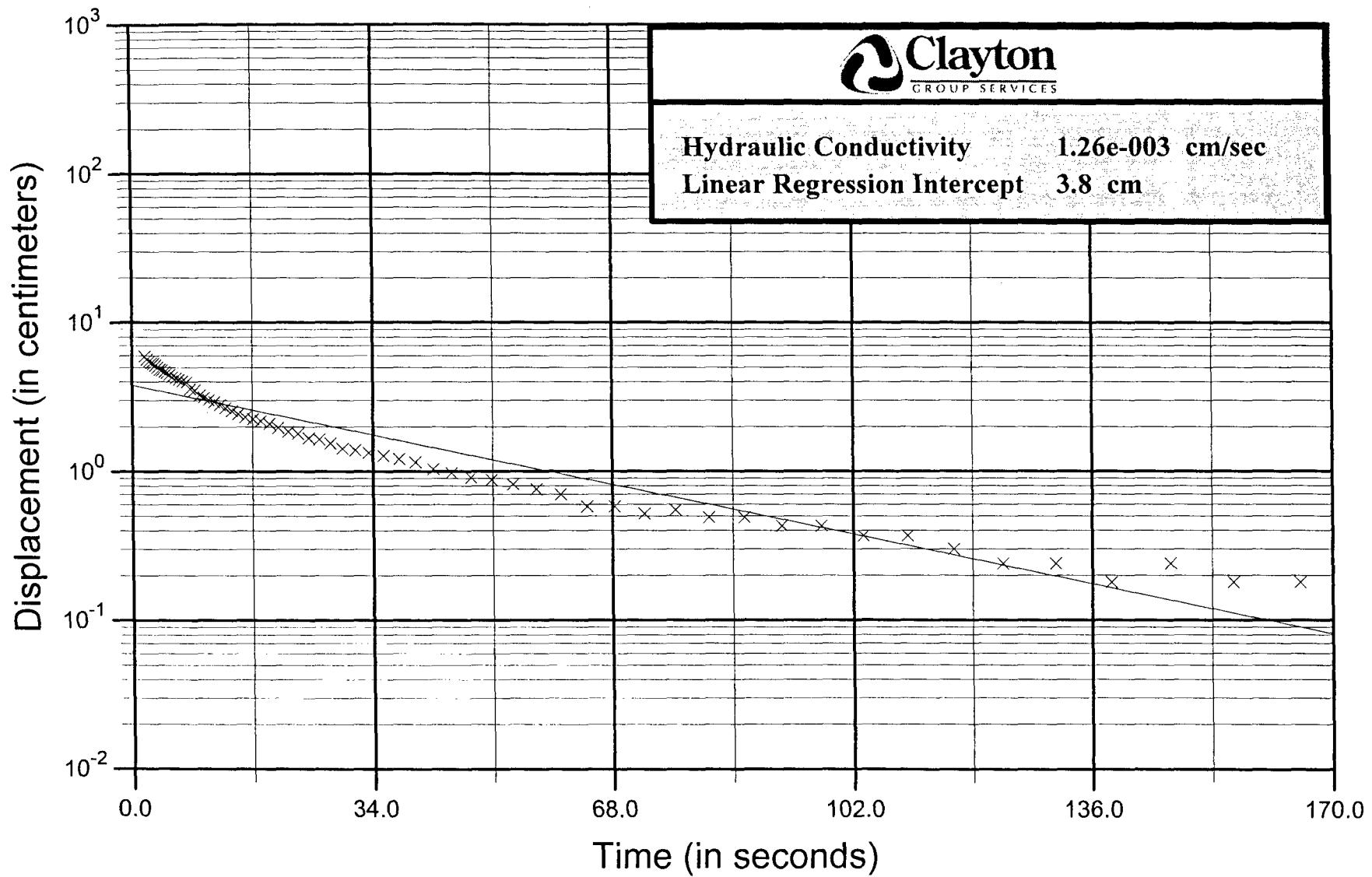
Slug Size: 3 ft x 1.5 in
Depth to water (bgs)=44.74'
Screen length (amount exposed to aquifer)=9.68'
Aquifer thickness=9.68'
Top of screen (water above screen)=0'

Date	Time	ET (sec)	Chan[1] Farenheit	Chan[2] Feet H2O	Time (sec)	Head (cm)
5/29/2003	11:07:32	0	53.48	0	-2.1	0.00
5/29/2003	11:07:33	0.3	53.5	-0.142	-1.8	-4.33
5/29/2003	11:07:33	0.6	53.53	-0.128	-1.5	-3.90
5/29/2003	11:07:33	0.9	53.53	-0.223	-1.2	-6.80
5/29/2003	11:07:34	1.2	53.53	0.572	-0.9	17.43
5/29/2003	11:07:34	1.5	53.53	0.008	-0.6	0.24

5/29/2003	11:07:34	1.8	53.53	-0.005	-0.3	-0.15
5/29/2003	11:07:34	2.1	53.53	0.051	0.0	1.55
5/29/2003	11:07:35	2.4	53.53	-0.049	0.3	-1.49
5/29/2003	11:07:35	2.7	53.53	-0.122	0.6	-3.72
5/29/2003	11:07:35	3	53.55	-0.166	0.9	-5.06
5/29/2003	11:07:36	3.3	53.55	-0.211	1.2	-6.43
5/29/2003	11:07:36	3.6	53.55	-0.253	1.5	-7.71
5/29/2003	11:07:36	3.9	53.55	-0.303	1.8	-9.24
5/29/2003	11:07:37	4.2	53.55	-0.343	2.1	-10.45
5/29/2003	11:07:37	4.5	53.55	-0.388	2.4	-11.83
5/29/2003	11:07:37	4.8	53.55	-0.428	2.7	-13.05
5/29/2003	11:07:37	5.1	53.55	-0.465	3.0	-14.17
5/29/2003	11:07:38	5.4	53.55	-0.501	3.3	-15.27
5/29/2003	11:07:38	5.7	53.55	-0.538	3.6	-16.40
5/29/2003	11:07:38	6	53.55	-0.572	3.9	-17.43
5/29/2003	11:07:39	6.4	53.55	-0.605	4.3	-18.44
5/29/2003	11:07:39	6.7	53.55	-0.64	4.6	-19.51
5/29/2003	11:07:39	7.1	53.55	-0.674	5.0	-20.54
5/29/2003	11:07:40	7.5	53.55	-0.707	5.4	-21.55
5/29/2003	11:07:40	8	53.55	-0.74	5.9	-22.56
5/29/2003	11:07:41	8.4	53.55	-0.771	6.3	-23.50
5/29/2003	11:07:41	8.9	53.55	-0.801	6.8	-24.41
5/29/2003	11:07:42	9.5	53.55	-0.832	7.4	-25.36
5/29/2003	11:07:42	10	53.53	-0.848	7.9	-25.85
5/29/2003	11:07:43	10.6	53.53	-0.867	8.5	-26.43
5/29/2003	11:07:44	11.3	53.53	-0.888	9.2	-27.07
5/29/2003	11:07:44	11.9	53.53	-0.908	9.8	-27.68
5/29/2003	11:07:45	12.6	53.53	-0.925	10.5	-28.19
5/29/2003	11:07:46	13.4	53.53	-0.938	11.3	-28.59
5/29/2003	11:07:47	14.2	53.53	-0.952	12.1	-29.02
5/29/2003	11:07:47	15	53.53	-0.967	12.9	-29.47
5/29/2003	11:07:48	15.9	53.53	-0.979	13.8	-29.84
5/29/2003	11:07:49	16.8	53.53	-0.988	14.7	-30.11
5/29/2003	11:07:50	17.8	53.53	-1.002	15.7	-30.54
5/29/2003	11:07:51	18.9	53.53	-1.01	16.8	-30.78
5/29/2003	11:07:52	20	53.53	-1.019	17.9	-31.06
5/29/2003	11:07:54	21.2	53.53	-1.029	19.1	-31.36
5/29/2003	11:07:55	22.4	53.53	-1.036	20.3	-31.58
5/29/2003	11:07:56	23.8	53.53	-1.042	21.7	-31.76
5/29/2003	11:07:58	25.2	53.53	-1.052	23.1	-32.06
5/29/2003	11:07:59	26.7	53.53	-1.056	24.6	-32.19
5/29/2003	11:08:01	28.2	53.53	-1.06	26.1	-32.31
5/29/2003	11:08:02	29.8	53.53	-1.063	27.7	-32.40
5/29/2003	11:08:04	31.5	53.53	-1.067	29.4	-32.52
5/29/2003	11:08:06	33.3	53.53	-1.071	31.2	-32.64
5/29/2003	11:08:08	35.2	53.53	-1.073	33.1	-32.71
5/29/2003	11:08:10	37.3	53.53	-1.077	35.2	-32.83
5/29/2003	11:08:12	39.5	53.53	-1.081	37.4	-32.95
5/29/2003	11:08:14	41.8	53.53	-1.085	39.7	-33.07
5/29/2003	11:08:17	44.3	53.53	-1.086	42.2	-33.10
5/29/2003	11:08:19	46.9	53.53	-1.088	44.8	-33.16
5/29/2003	11:08:22	49.7	53.53	-1.09	47.6	-33.22

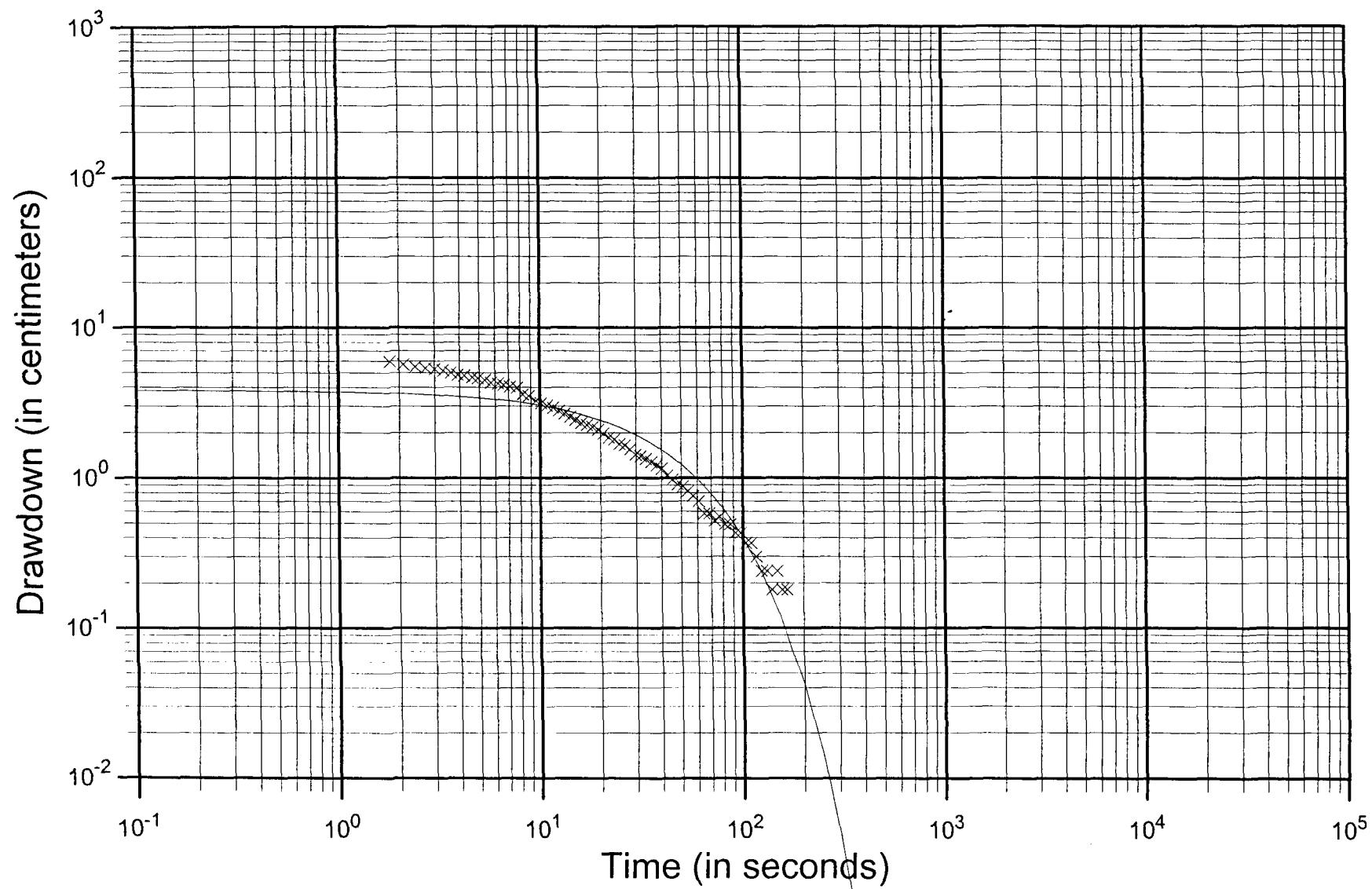
5/29/2003	11:08:25	52.6	53.53	-1.092	50.5	-33.28
5/29/2003	11:08:28	55.7	53.53	-1.094	53.6	-33.35
5/29/2003	11:08:31	59	53.53	-1.094	56.9	-33.35
5/29/2003	11:08:35	62.5	53.5	-1.096	60.4	-33.41
5/29/2003	11:08:39	66.2	53.5	-1.096	64.1	-33.41
5/29/2003	11:08:42	70.1	53.5	-1.098	68.0	-33.47
5/29/2003	11:08:47	74.3	53.5	-1.1	72.2	-33.53
5/29/2003	11:08:51	78.7	53.5	-1.1	76.6	-33.53
5/29/2003	11:08:56	83.4	53.5	-1.1	81.3	-33.53
5/29/2003	11:09:01	88.4	53.5	-1.1	86.3	-33.53
5/29/2003	11:09:06	93.7	53.5	-1.102	91.6	-33.59
5/29/2003	11:09:12	99.3	53.5	-1.104	97.2	-33.65
5/29/2003	11:09:18	105.2	53.5	-1.102	103.1	-33.59
5/29/2003	11:09:24	111.5	53.5	-1.104	109.4	-33.65
5/29/2003	11:09:30	118.1	53.48	-1.104	116.0	-33.65
5/29/2003	11:09:37	125.1	53.48	-1.104	123.0	-33.65
5/29/2003	11:09:45	132.6	53.48	-1.106	130.5	-33.71
5/29/2003	11:09:53	140.5	53.48	-1.106	138.4	-33.71
5/29/2003	11:10:01	148.9	53.48	-1.106	146.8	-33.71
5/29/2003	11:10:10	157.8	53.48	-1.108	155.7	-33.77

MW1117 Falling Head Slug Test

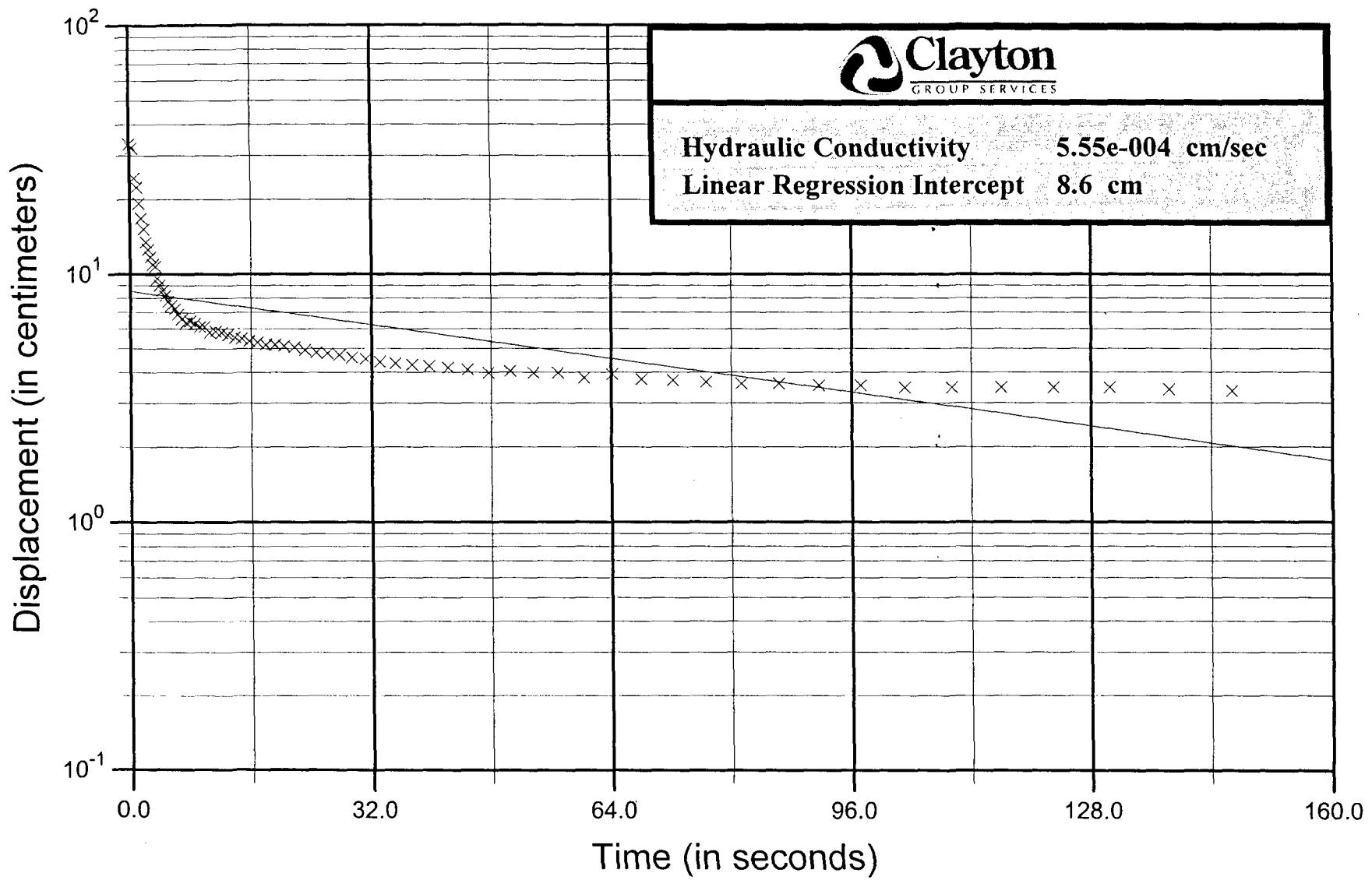


Bouwer and Rice Method (1976)

MW1117 FH (Plot vs. Predicted Curve)

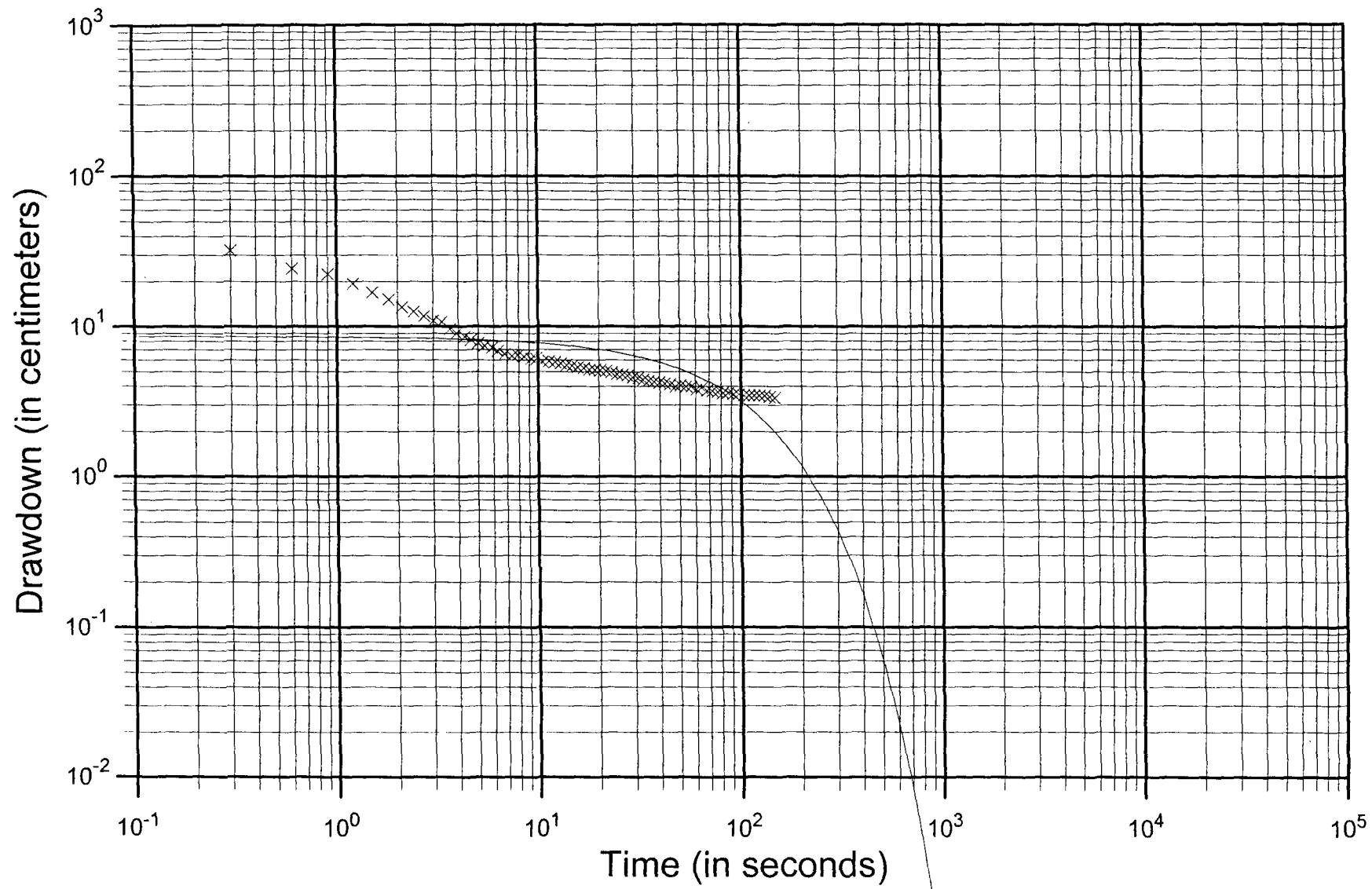


MW1117 Rising Head Slug Test

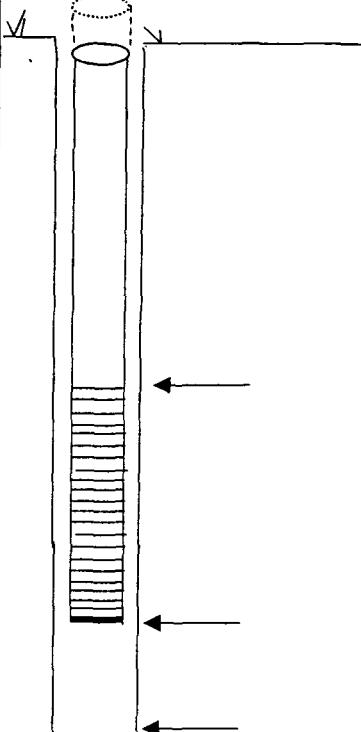


Bouwer and Rice Method (1976)

MW1117 RH (Plot vs. Predicted Curve)



SLUG TEST DATA FORM

PROJECT INFORMATION									
Project Name	Lockformer	Lisle, IL	Well ID	MW-1117					
Project No.	15-65263.01-001		Test Date	5/29/2003					
Field Personnel	D. Lamsma, K. Woloszyn			Unconfined					
EQUIPMENT INFORMATION				ILLUSTRATION OF INFORMATION					
Data Logger Type / Model No.	In-Situ								
Transducer Type / Model No.	Minitroll #5914								
Slug Length / Volume	3 feet / 0.28 gallons								
GENERAL INFORMATION									
Static Groundwater Elevation	653.555 ft MSL								
Ground Surface Elevation	708.4 ft MSL								
Top of Casing Elevation	711.255 ft MSL								
Well Stick-up	2.855	ft	87.0	cm					
Depth to Water	57.7	ft	1758.7	cm					
Diameter of Well Casing	2	in	5.1	cm					
Diameter of Borehole at Screen	8	in	20.3	cm					
Screen Interval	52.5 - 62.5	ft BG	1600 - 1905	cm BG					
Screen Length	10	ft	304.8	cm					
Base of Boring	65	ft BG	1981.2	cm BG					
Base of Upper Confining Unit	---	ft BG	0.0	cm BG					
Top of Lower Confining Unit	---	ft BG	0.0	cm BG					
Saturated Thickness (b)	8.5	ft	259.1	cm					
Static Height of Water in Well	8.09	ft	246.6	cm					
Geology of Aquifer	Sand								
SLUG TEST MEASUREMENT INFORMATION									
Parameter	Falling Head			Rising Head					
Initial Water Level Above Transducer	7	ft	213.36	cm	7	ft	213.36	cm	
Initial Drawdown/Recovery	1.63	ft	49.8	cm	1.10	ft	33.38	cm	
SLUG TEST RESULTS									
Falling H	Rising H	Analysis Method		Parameter	Calculated Value and Units				
Notes:									

In-Situ Inc.

MiniTroll Pro

Report generated:

5/29/2003 16:49:26

Report from file:

...\\SN05914 2003-05-29 135950 MW1117 FH.bin

Win-Situ Version

4.41

Serial number:

5914

Firmware Version

3.07

Unit name:

MiniTROLL

Test name:

MW1117 FH

Test defined on:

5/29/2003 13:59:30

Test started on:

5/29/2003 13:59:50

Test stopped on:

5/29/2003 14:02:47

Test extracted on:

N/A N/A

Data gathered using Logarithmic testing

Maximum time between data points: 600.0 Seconds.

Number of data samples: 79

TOTAL DATA SAMPLES

79

Channel number [1]

Measurement type: Temperature

Channel name: Temperature

Channel number [2]

Measurement type: Pressure

Channel name: Pressure

Sensor Range: 30 PSIG.

Specific gravity: 1

Mode: Surface

User-defined reference: 0 Feet H2O

Referenced on: test start

Pressure head at reference: 7.784 Feet H2O

Slug Size: 3 ft x 1.5 in

Depth to water (bgs)=54.7'

Screen length (amount exposed to aquifer)=6.3'

Aquifer thickness=6.3'

Top of screen (water above screen)=0'

Date	Time	ET (sec)	Chan[1]	Chan[2]	Time (sec)	Head (cm)
			Fahrenheit	Feet H2O		
5/29/2003	13:59:50	0	54.03	0	-1.8	0.00
5/29/2003	13:59:50	0.3	54.07	0.015	-1.5	0.46
5/29/2003	13:59:51	0.6	54.07	0.515	-1.2	15.70
5/29/2003	13:59:51	0.9	54.07	1.171	-0.9	35.69
5/29/2003	13:59:51	1.2	54.1	0.74	-0.6	22.56
5/29/2003	13:59:52	1.5	54.1	1.452	-0.3	44.26

5/29/2003	13:59:52	1.8	54.1	1.634	0.0	49.80
5/29/2003	13:59:52	2.1	54.1	0.772	0.3	23.53
5/29/2003	13:59:52	2.4	54.1	0.276	0.6	8.41
5/29/2003	13:59:53	2.7	54.1	0.114		
5/29/2003	13:59:53	3	54.1	-0.276		
5/29/2003	13:59:53	3.3	54.1	0.159	1.5	4.85
5/29/2003	13:59:54	3.6	54.1	0.195	1.8	5.94
5/29/2003	13:59:54	3.9	54.1	0.186	2.1	5.67
5/29/2003	13:59:54	4.2	54.1	0.18	2.4	5.49
5/29/2003	13:59:55	4.5	54.1	0.176	2.7	5.36
5/29/2003	13:59:55	4.8	54.1	0.174	3.0	5.30
5/29/2003	13:59:55	5.1	54.1	0.17	3.3	5.18
5/29/2003	13:59:55	5.4	54.1	0.164	3.6	5.00
5/29/2003	13:59:56	5.7	54.1	0.159	3.9	4.85
5/29/2003	13:59:56	6	54.1	0.157	4.2	4.79
5/29/2003	13:59:56	6.4	54.12	0.153	4.6	4.66
5/29/2003	13:59:57	6.7	54.1	0.151	4.9	4.60
5/29/2003	13:59:57	7.1	54.1	0.147	5.3	4.48
5/29/2003	13:59:58	7.5	54.1	0.141	5.7	4.30
5/29/2003	13:59:58	8	54.1	0.139	6.2	4.24
5/29/2003	13:59:58	8.4	54.1	0.136	6.6	4.15
5/29/2003	13:59:59	8.9	54.12	0.133	7.1	4.05
5/29/2003	14:00:00	9.5	54.12	0.131	7.7	3.99
5/29/2003	14:00:00	10	54.1	0.118	8.2	3.60
5/29/2003	14:00:01	10.6	54.07	0.115	8.8	3.51
5/29/2003	14:00:01	11.3	54.07	0.107	9.5	3.26
5/29/2003	14:00:02	11.9	54.07	0.103	10.1	3.14
5/29/2003	14:00:03	12.6	54.07	0.099	10.8	3.02
5/29/2003	14:00:03	13.4	54.07	0.096	11.6	2.93
5/29/2003	14:00:04	14.2	54.07	0.092	12.4	2.80
5/29/2003	14:00:05	15	54.07	0.088	13.2	2.68
5/29/2003	14:00:06	15.9	54.07	0.084	14.1	2.56
5/29/2003	14:00:07	16.8	54.07	0.08	15.0	2.44
5/29/2003	14:00:08	17.8	54.07	0.076	16.0	2.32
5/29/2003	14:00:09	18.9	54.07	0.074	17.1	2.26
5/29/2003	14:00:10	20	54.07	0.072	18.2	2.19
5/29/2003	14:00:11	21.2	54.07	0.069	19.4	2.10
5/29/2003	14:00:13	22.4	54.07	0.065	20.6	1.98
5/29/2003	14:00:14	23.8	54.07	0.061	22.0	1.86
5/29/2003	14:00:15	25.2	54.07	0.059	23.4	1.80
5/29/2003	14:00:17	26.7	54.07	0.055	24.9	1.68
5/29/2003	14:00:18	28.2	54.05	0.054	26.4	1.65
5/29/2003	14:00:20	29.8	54.07	0.051	28.0	1.55
5/29/2003	14:00:22	31.5	54.07	0.047	29.7	1.43
5/29/2003	14:00:23	33.3	54.05	0.046	31.5	1.40
5/29/2003	14:00:25	35.2	54.07	0.044	33.4	1.34
5/29/2003	14:00:27	37.3	54.05	0.042	35.5	1.28
5/29/2003	14:00:30	39.5	54.05	0.04	37.7	1.22
5/29/2003	14:00:32	41.8	54.05	0.038	40.0	1.16
5/29/2003	14:00:34	44.3	54.05	0.034	42.5	1.04
5/29/2003	14:00:37	46.9	54.05	0.032	45.1	0.98
5/29/2003	14:00:40	49.7	54.05	0.03	47.9	0.91

5/29/2003	14:00:43	52.6	54.05	0.029	50.8	0.88
5/29/2003	14:00:46	55.7	54.05	0.027	53.9	0.82
5/29/2003	14:00:49	59	54.03	0.025	57.2	0.76
5/29/2003	14:00:53	62.5	54.03	0.023	60.7	0.70
5/29/2003	14:00:56	66.2	54.03	0.019	64.4	0.58
5/29/2003	14:01:00	70.1	54.03	0.019	68.3	0.58
5/29/2003	14:01:04	74.3	54.03	0.017	72.5	0.52
5/29/2003	14:01:09	78.7	54	0.018	76.9	0.55
5/29/2003	14:01:13	83.4	54	0.016	81.6	0.49
5/29/2003	14:01:18	88.4	54	0.016	86.6	0.49
5/29/2003	14:01:24	93.7	54	0.014	91.9	0.43
5/29/2003	14:01:29	99.3	54	0.014	97.5	0.43
5/29/2003	14:01:35	105.2	53.98	0.012	103.4	0.37
5/29/2003	14:01:42	111.5	53.98	0.012	109.7	0.37
5/29/2003	14:01:48	118.1	53.98	0.01	116.3	0.30
5/29/2003	14:01:55	125.1	53.98	0.008	123.3	0.24
5/29/2003	14:02:03	132.6	53.98	0.008	130.8	0.24
5/29/2003	14:02:11	140.5	53.98	0.006	138.7	0.18
5/29/2003	14:02:19	148.9	53.98	0.008	147.1	0.24
5/29/2003	14:02:28	157.8	53.98	0.006	156.0	0.18
5/29/2003	14:02:37	167.2	53.98	0.006	165.4	0.18

In-Situ Inc. MiniTroll Pro

Report generated: 5/29/2003 16:50:15
 Report from file: ...\\SN05914 2003-05-29 140802 MW1117 RH.bin
 Win-Situ Version 4.41

Serial number: 5914
 Firmware Version 3.07
 Unit name: MiniTROLL

Test name: MW1117 RH

Test defined on: 5/29/2003 14:07:34
 Test started on: 5/29/2003 14:08:02
 Test stopped on: 5/29/2003 14:15:02
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing
 Maximum time between data points: 600.0 Seconds.
 Number of data samples: 94

TOTAL DATA SAMPLES 94

Channel number [1]
 Measurement type: Temperature
 Channel name: Temperature

Channel number [2]
 Measurement type: Pressure
 Channel name: Pressure
 Sensor Range: 30 PSIG.
 Specific gravity: 1
 Mode: TOC
 User-defined reference: 0 Feet H2O
 Referenced on: test start
 Pressure head at reference: 7.887 Feet H2O

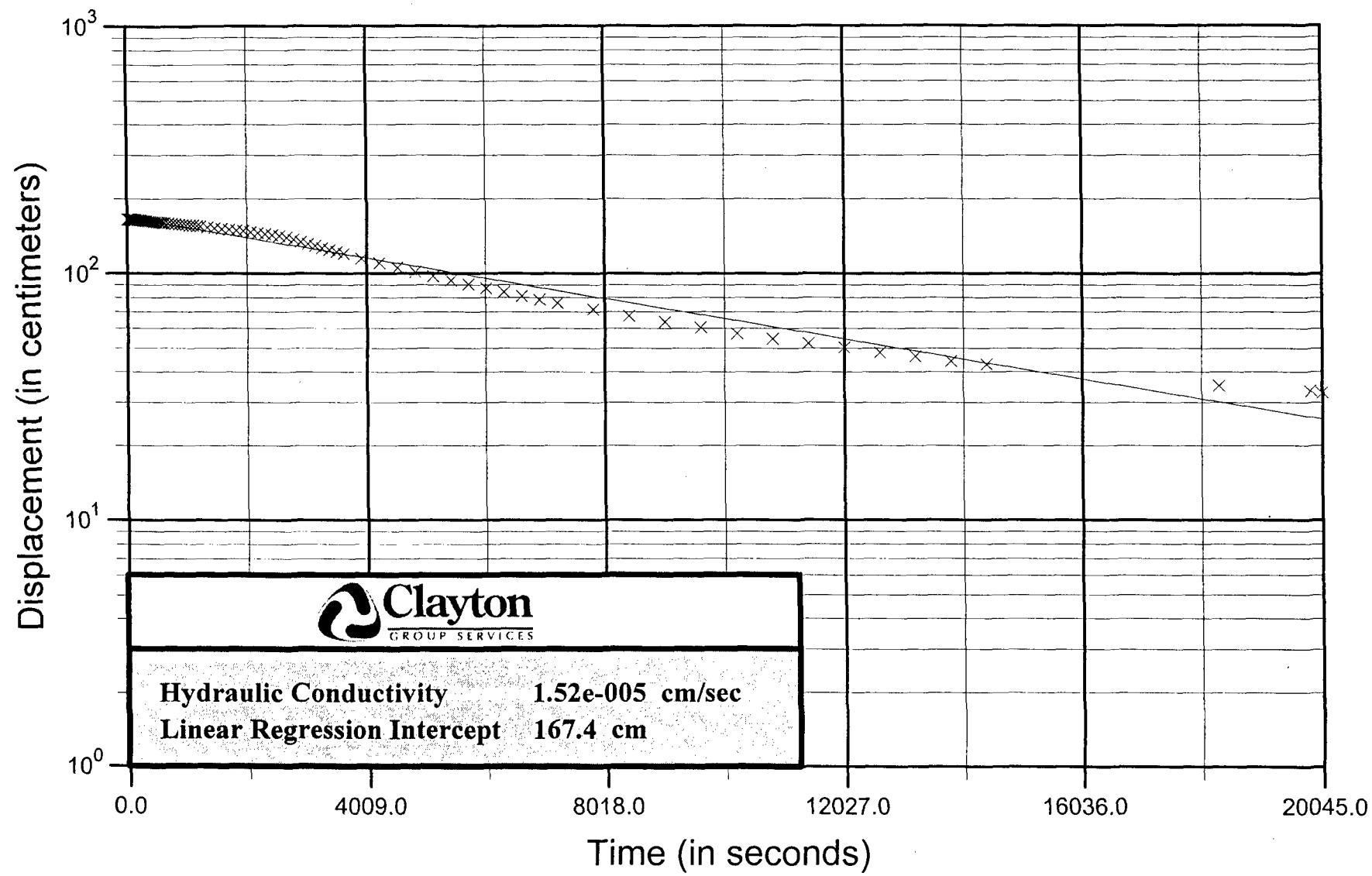
Slug Size: 3 ft x 1.5 in
Depth to water (bgs)=54.7'
Screen length (amount exposed to aquifer)=6.3'
Aquifer thickness=6.3'
Top of screen (water above screen)=0'

Date	Time	ET (sec)	Chan[1] Fahrenheit	Chan[2] Feet H2O	Time (sec)	Head (cm)
5/29/2003	14:08:02	0	53.98	0	-2.1	0.00
5/29/2003	14:08:02	0.3	54	0.849	-1.8	25.88
5/29/2003	14:08:02	0.6	54.03	0.876	-1.5	26.70
5/29/2003	14:08:03	0.9	54.03	0.734	-1.2	22.37
5/29/2003	14:08:03	1.2	54.03	0.11	-0.9	3.35
5/29/2003	14:08:03	1.5	54.03	1.038	-0.6	31.64

Date	Time	ET (sec)	Chan[1]	Chan[2]	Time (sec)	Head (cm)
			Fahrenheit	Feet H2O		
5/29/2003	14:08:04	1.8	54.03	0.924	-0.3	28.16
5/29/2003	14:08:04	2.1	54.03	1.095	0.0	33.38
5/29/2003	14:08:04	2.4	54.03	1.055	0.3	32.16
5/29/2003	14:08:04	2.7	54.03	0.801	0.6	24.41
5/29/2003	14:08:05	3	54.03	0.736	0.9	22.43
5/29/2003	14:08:05	3.3	54.03	0.634	1.2	19.32
5/29/2003	14:08:05	3.6	54.03	0.553	1.5	16.86
5/29/2003	14:08:06	3.9	54.03	0.499	1.8	15.21
5/29/2003	14:08:06	4.2	54.03	0.443	2.1	13.50
5/29/2003	14:08:06	4.5	54.05	0.413	2.4	12.59
5/29/2003	14:08:07	4.8	54.05	0.386	2.7	11.77
5/29/2003	14:08:07	5.1	54.05	0.359	3.0	10.94
5/29/2003	14:08:07	5.4	54.05	0.353	3.3	10.76
5/29/2003	14:08:07	5.7	54.05	0.315	3.6	9.60
5/29/2003	14:08:08	6	54.05	0.297	3.9	9.05
5/29/2003	14:08:08	6.4	54.05	0.282	4.3	8.60
5/29/2003	14:08:08	6.7	54.05	0.268	4.6	8.17
5/29/2003	14:08:09	7.1	54.05	0.255	5.0	7.77
5/29/2003	14:08:09	7.5	54.05	0.245	5.4	7.47
5/29/2003	14:08:10	8	54.05	0.238	5.9	7.25
5/29/2003	14:08:10	8.4	54.05	0.226	6.3	6.89
5/29/2003	14:08:11	8.9	54.05	0.216	6.8	6.58
5/29/2003	14:08:11	9.5	54.05	0.209	7.4	6.37
5/29/2003	14:08:12	10	54.03	0.212	7.9	6.46
5/29/2003	14:08:12	10.6	54.03	0.207	8.5	6.31
5/29/2003	14:08:13	11.3	54.03	0.201	9.2	6.13
5/29/2003	14:08:14	11.9	54.03	0.201	9.8	6.13
5/29/2003	14:08:14	12.6	54.03	0.191	10.5	5.82
5/29/2003	14:08:15	13.4	54.03	0.193	11.3	5.88
5/29/2003	14:08:16	14.2	54.03	0.191	12.1	5.82
5/29/2003	14:08:17	15	54.03	0.187	12.9	5.70
5/29/2003	14:08:18	15.9	54.03	0.182	13.8	5.55
5/29/2003	14:08:19	16.8	54.03	0.18	14.7	5.49
5/29/2003	14:08:20	17.8	54.03	0.176	15.7	5.36
5/29/2003	14:08:21	18.9	54.03	0.174	16.8	5.30
5/29/2003	14:08:22	20	54.03	0.17	17.9	5.18
5/29/2003	14:08:23	21.2	54.03	0.17	19.1	5.18
5/29/2003	14:08:24	22.4	54.03	0.168	20.3	5.12
5/29/2003	14:08:25	23.8	54.03	0.166	21.7	5.06
5/29/2003	14:08:27	25.2	54.03	0.162	23.1	4.94
5/29/2003	14:08:28	26.7	54.03	0.158	24.6	4.82
5/29/2003	14:08:30	28.2	54.03	0.157	26.1	4.79
5/29/2003	14:08:31	29.8	54.03	0.155	27.7	4.72
5/29/2003	14:08:33	31.5	54.03	0.151	29.4	4.60
5/29/2003	14:08:35	33.3	54.03	0.149	31.2	4.54
5/29/2003	14:08:37	35.2	54.03	0.145	33.1	4.42
5/29/2003	14:08:39	37.3	54.03	0.143	35.2	4.36
5/29/2003	14:08:41	39.5	54.03	0.141	37.4	4.30
5/29/2003	14:08:43	41.8	54.03	0.139	39.7	4.24

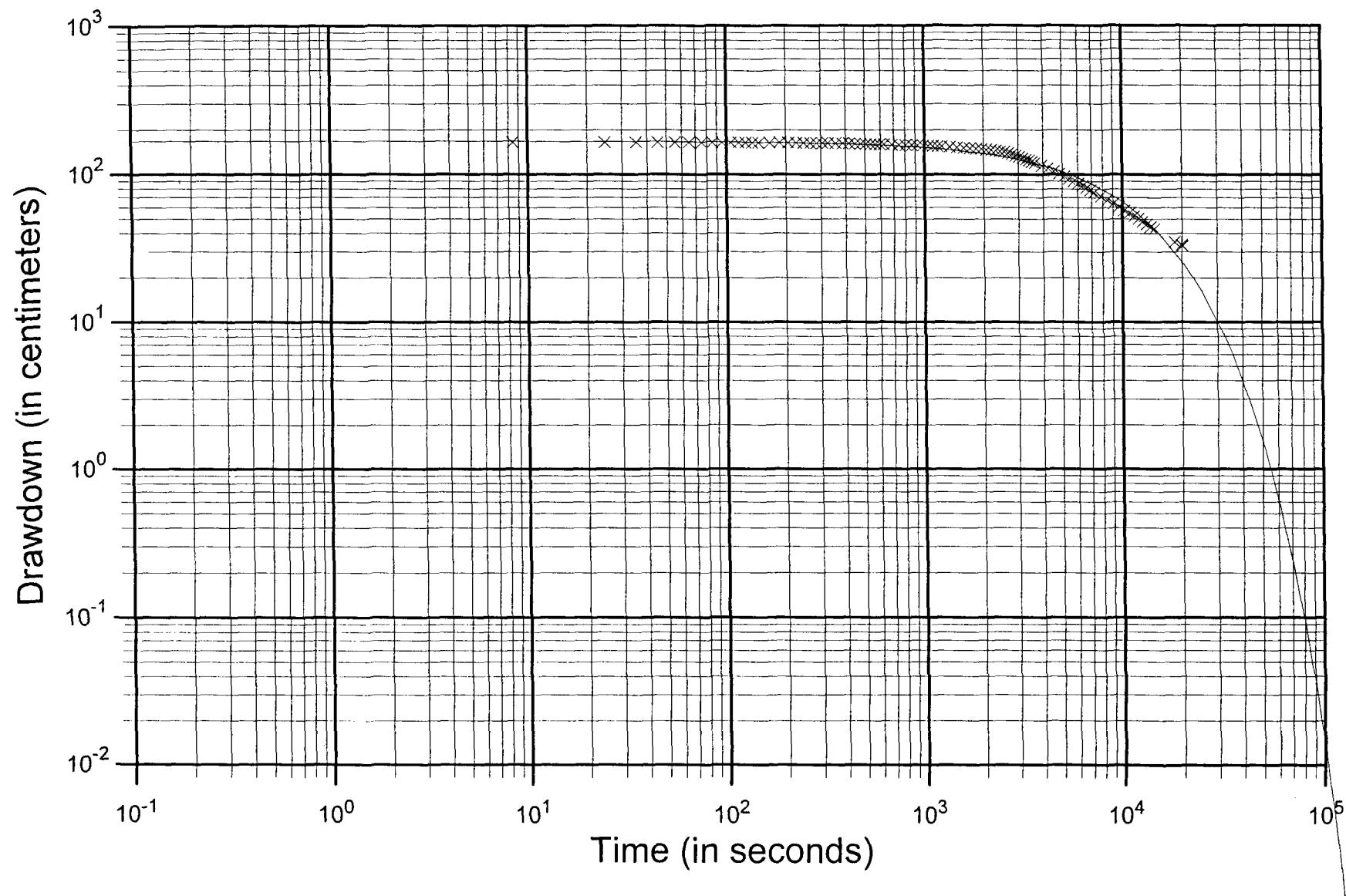
Date	Time	ET (sec)	Chan[1]	Chan[2]	Time (sec)	Head (cm)
			Fahrenheit	Feet H2O		
5/29/2003	14:08:46	44.3	54.03	0.137	42.2	4.18
5/29/2003	14:08:49	46.9	54.03	0.135	44.8	4.11
5/29/2003	14:08:51	49.7	54.03	0.131	47.6	3.99
5/29/2003	14:08:54	52.6	54.03	0.133	50.5	4.05
5/29/2003	14:08:57	55.7	54.03	0.131	53.6	3.99
5/29/2003	14:09:01	59	54.03	0.131	56.9	3.99
5/29/2003	14:09:04	62.5	54	0.125	60.4	3.81
5/29/2003	14:09:08	66.2	54	0.129	64.1	3.93
5/29/2003	14:09:12	70.1	54	0.123	68.0	3.75
5/29/2003	14:09:16	74.3	54	0.122	72.2	3.72
5/29/2003	14:09:20	78.7	54	0.12	76.6	3.66
5/29/2003	14:09:25	83.4	54	0.118	81.3	3.60
5/29/2003	14:09:30	88.4	54	0.118	86.3	3.60
5/29/2003	14:09:35	93.7	54	0.116	91.6	3.54
5/29/2003	14:09:41	99.3	54	0.116	97.2	3.54
5/29/2003	14:09:47	105.2	54	0.114	103.1	3.47
5/29/2003	14:09:53	111.5	54	0.114	109.4	3.47
5/29/2003	14:10:00	118.1	54	0.114	116.0	3.47
5/29/2003	14:10:07	125.1	54	0.114	123.0	3.47
5/29/2003	14:10:14	132.6	54	0.114	130.5	3.47
5/29/2003	14:10:22	140.5	54	0.112	138.4	3.41
5/29/2003	14:10:31	148.9	54	0.11	146.8	3.35
5/29/2003	14:10:39	157.8	54	0.112	155.7	3.41
5/29/2003	14:10:49	167.2	54	0.112	165.1	3.41
5/29/2003	14:10:59	177.2	54	0.112	175.1	3.41
5/29/2003	14:11:09	187.8	54	0.108	185.7	3.29
5/29/2003	14:11:21	199	54	0.11	196.9	3.35
5/29/2003	14:11:33	210.9	54	0.11	208.8	3.35
5/29/2003	14:11:45	223.5	54	0.11	221.4	3.35
5/29/2003	14:11:58	236.8	54	0.11	234.7	3.35
5/29/2003	14:12:13	250.9	54	0.108	248.8	3.29
5/29/2003	14:12:27	265.8	54	0.108	263.7	3.29
5/29/2003	14:12:43	281.6	53.98	0.108	279.5	3.29
5/29/2003	14:13:00	298.4	53.98	0.11	296.3	3.35
5/29/2003	14:13:18	316.2	53.98	0.108	314.1	3.29
5/29/2003	14:13:37	335	53.98	0.108	332.9	3.29
5/29/2003	14:13:57	354.9	53.98	0.108	352.8	3.29
5/29/2003	14:14:18	376	53.98	0.108	373.9	3.29
5/29/2003	14:14:40	398.4	53.98	0.11	396.3	3.35

MW1122S Rising Head Slug Test



Bouwer and Rice Method (1976)

MW1122S RH (Plot vs. Predicted Curve)



SLUG TEST DATA FORM

PROJECT INFORMATION						
Project Name	Lockformer Lisle, IL					
Project No.	15-65263.60-001					
Field Personnel	J. Campbell					
EQUIPMENT INFORMATION						
Data Logger Type / Model No.	Aquistar DL-8A					
Transducer Type / Model No.	15 psi					
Slug Length / Volume	None					
GENERAL INFORMATION						
Static Groundwater Elevation	ft MSL					
Ground Surface Elevation	ft MSL					
Top of Casing Elevation	ft MSL					
Well Stick-up	1.8	ft	54.9 cm			
Depth to Water	42.92	ft	1308.2 cm			
Diameter of Well Casing	2	in	5.1 cm			
Diameter of Borehole at Screen	8	in	20.3 cm			
Screen Interval	45.1 - 47.1	ft BG	1375 - 1436 cm BG			
Screen Length	2	ft	61.0 cm			
Base of Boring	47.5	ft BG	1447.8 cm BG			
Base of Upper Confining Unit	---	ft BG	0.0 cm BG			
Top of Lower Confining Unit	---	ft BG	0.0 cm BG			
Saturated Thickness (b)	---	ft	0.0 cm			
Static Height of Water in Well	6.48	ft	197.5 cm			
Geology of Aquifer	Silty Clay					
SLUG TEST MEASUREMENT INFORMATION						
Parameter	Falling Head			Rising Head		
Initial Water Level Above Transducer		ft	cm	4.5	ft	137.16 cm
Initial Drawdown/Recovery		ft	cm	5.42	ft	165.20 cm
SLUG TEST RESULTS						
Falling H	Rising H	Analysis Method		Parameter	Calculated Value and Units	
Notes: Well was bailed dry prior to starting Rising Head test						

SLUG TEST DATA FOR MW1122S RISING HEAD

Project Name: Lockformer
Project Number: 15-65263

Date : 2-Jan-04
Field Personnel: Joe Campbell

Static Water Column Height Before Test (feet):

5.97E+00

Data Logger: Aquistar DL-8A

Maximum Displacement of Water Column (cm):

165.2

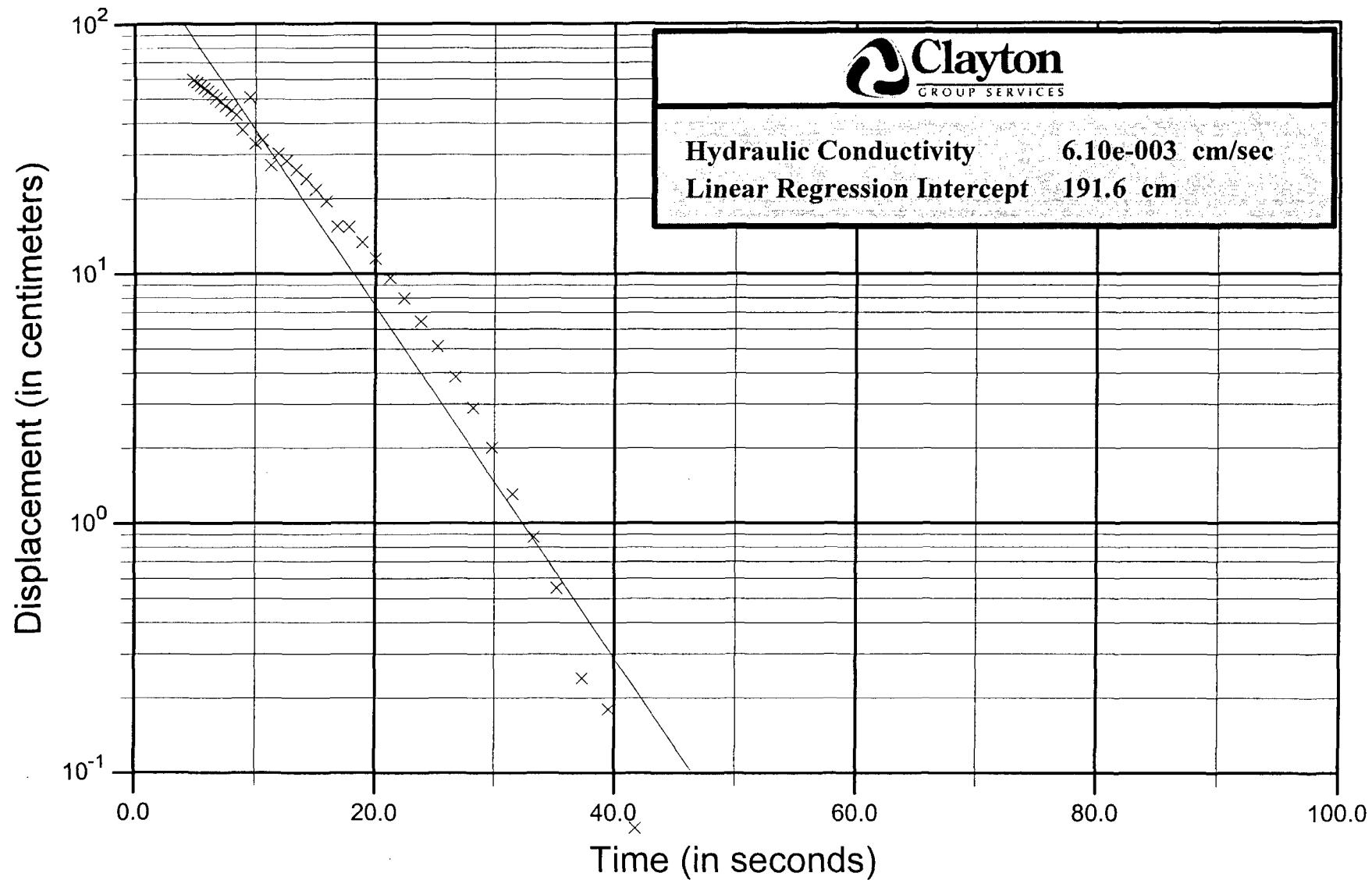
Transducer: 15 psi

Method: Pump Down

Date	Time	Analog#01	Time (sec)	Displacement (cm)	Displacement (feet)
		AMP.....			
AMP.....	FT.....				
01/02/04	8:13:29	5.52E-01	0.0	165.2	5.4
01/02/04	8:13:38	5.52E-01	8.4	165.2	5.4
01/02/04	8:13:54	5.52E-01	24.5	165.2	5.4
01/02/04	8:14:04	5.52E-01	35.2	165.2	5.4
01/02/04	8:14:14	5.52E-01	45.2	165.2	5.4
01/02/04	8:14:24	5.52E-01	55.2	165.2	5.4
01/02/04	8:14:34	5.63E-01	65.1	164.9	5.4
01/02/04	8:14:44	5.63E-01	75.1	164.9	5.4
01/02/04	8:14:54	5.74E-01	85.2	164.6	5.4
01/02/04	8:15:04	5.74E-01	95.2	164.6	5.4
01/02/04	8:15:14	5.74E-01	105.2	164.6	5.4
01/02/04	8:15:24	5.74E-01	115.2	164.6	5.4
01/02/04	8:15:34	5.74E-01	125.1	164.6	5.4
01/02/04	8:15:44	5.85E-01	135.2	164.2	5.4
01/02/04	8:15:54	5.85E-01	145.2	164.2	5.4
01/02/04	8:16:14	5.96E-01	165.2	163.9	5.4
01/02/04	8:16:34	5.85E-01	185.2	164.2	5.4
01/02/04	8:16:54	5.96E-01	205.2	163.9	5.4
01/02/04	8:17:14	5.96E-01	225.1	163.9	5.4
01/02/04	8:17:34	6.06E-01	245.1	163.6	5.4
01/02/04	8:17:54	6.17E-01	265.2	163.2	5.4
01/02/04	8:18:14	6.17E-01	285.1	163.2	5.4
01/02/04	8:18:34	6.28E-01	305.2	162.9	5.3
01/02/04	8:18:54	6.28E-01	325.2	162.9	5.3
01/02/04	8:19:24	6.50E-01	355.2	162.2	5.3
01/02/04	8:19:54	6.61E-01	385.2	161.9	5.3
01/02/04	8:20:24	6.71E-01	415.2	161.6	5.3
01/02/04	8:20:54	6.82E-01	445.2	161.3	5.3
01/02/04	8:21:24	6.82E-01	475.2	161.3	5.3
01/02/04	8:21:54	7.04E-01	505.2	160.6	5.3
01/02/04	8:22:24	7.04E-01	535.2	160.6	5.3
01/02/04	8:22:54	7.15E-01	565.2	160.3	5.3
01/02/04	8:23:24	7.25E-01	595.2	159.9	5.2
01/02/04	8:23:54	7.25E-01	625.2	159.9	5.2
01/02/04	8:24:54	7.47E-01	685.2	159.3	5.2
01/02/04	8:25:54	7.69E-01	745.2	158.6	5.2
01/02/04	8:26:54	7.80E-01	805.2	158.3	5.2
01/02/04	8:27:54	8.01E-01	865.2	157.6	5.2
01/02/04	8:28:54	8.12E-01	925.2	157.3	5.2

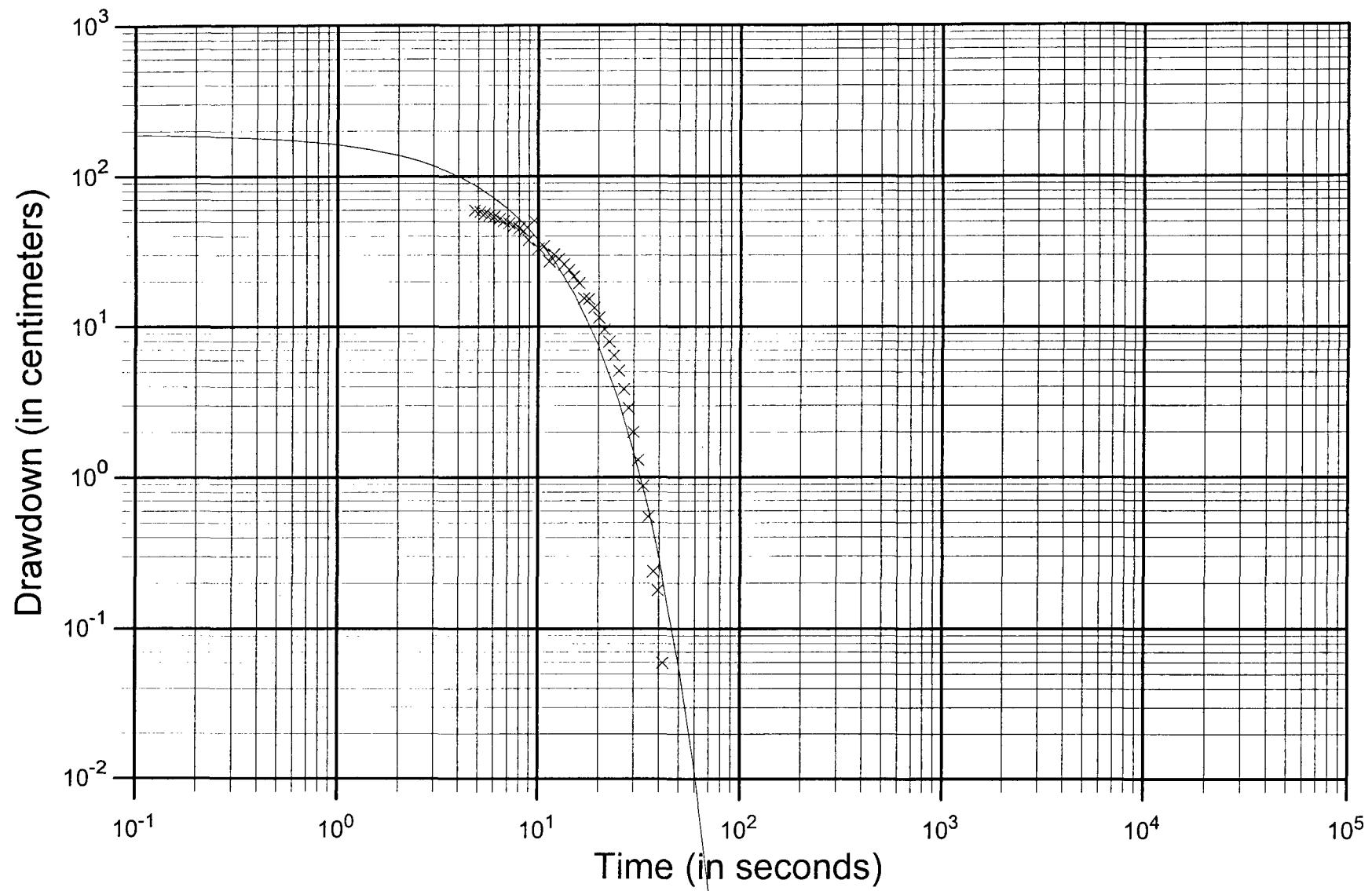
Date	Time	Analog#01		Time (sec)	Displacement (cm)	Displacement (feet)
		AMP.....	FT.....			
01/02/04	8:29:54	8.23E-01		985.2	157.0	5.1
01/02/04	8:30:54	8.45E-01		1045.2	156.3	5.1
01/02/04	8:31:54	8.55E-01		1105.2	156.0	5.1
01/02/04	8:32:54	8.77E-01		1165.2	155.3	5.1
01/02/04	8:33:54	8.88E-01		1225.2	155.0	5.1
01/02/04	8:35:54	9.31E-01		1345.2	153.7	5.0
01/02/04	8:37:54	9.64E-01		1465.2	152.7	5.0
01/02/04	8:39:54	1.01E+00		1585.2	151.4	5.0
01/02/04	8:41:54	1.04E+00		1705.2	150.4	4.9
01/02/04	8:43:54	1.07E+00		1825.2	149.4	4.9
01/02/04	8:45:54	1.09E+00		1945.2	148.7	4.9
01/02/04	8:47:54	1.15E+00		2065.2	147.1	4.8
01/02/04	8:49:54	1.18E+00		2185.2	146.1	4.8
01/02/04	8:51:54	1.22E+00		2305.2	144.8	4.7
01/02/04	8:53:54	1.27E+00		2425.2	143.4	4.7
01/02/04	8:55:54	1.30E+00		2545.2	142.4	4.7
01/02/04	8:57:54	1.38E+00		2665.2	140.1	4.6
01/02/04	8:59:54	1.47E+00		2785.2	137.2	4.5
01/02/04	9:01:54	1.57E+00		2905.2	134.2	4.4
01/02/04	9:03:54	1.66E+00		3025.2	131.6	4.3
01/02/04	9:05:54	1.73E+00		3145.2	129.2	4.2
01/02/04	9:07:54	1.82E+00		3265.2	126.6	4.2
01/02/04	9:09:54	1.88E+00		3385.2	124.6	4.1
01/02/04	9:11:54	1.96E+00		3505.2	122.3	4.0
01/02/04	9:13:54	2.02E+00		3625.2	120.3	3.9
01/02/04	9:18:54	2.20E+00		3925.2	115.0	3.8
01/02/04	9:23:54	2.35E+00		4225.2	110.4	3.6
01/02/04	9:28:54	2.51E+00		4525.2	105.5	3.5
01/02/04	9:33:54	2.64E+00		4825.2	101.5	3.3
01/02/04	9:38:54	2.77E+00		5125.2	97.6	3.2
01/02/04	9:43:54	2.89E+00		5425.2	93.9	3.1
01/02/04	9:48:54	3.00E+00		5725.2	90.6	3.0
01/02/04	9:53:54	3.11E+00		6025.2	87.3	2.9
01/02/04	9:58:54	3.21E+00		6325.2	84.4	2.8
01/02/04	10:03:54	3.30E+00		6625.2	81.4	2.7
01/02/04	10:08:54	3.39E+00		6925.2	78.7	2.6
01/02/04	10:13:54	3.48E+00		7225.2	76.1	2.5
01/02/04	10:23:54	3.62E+00		7825.2	71.8	2.4
01/02/04	10:33:54	3.76E+00		8425.2	67.5	2.2
01/02/04	10:43:54	3.88E+00		9025.2	63.9	2.1
01/02/04	10:53:54	3.98E+00		9625.2	60.6	2.0
01/02/04	11:03:54	4.09E+00		10225.2	57.3	1.9
01/02/04	11:13:54	4.18E+00		10825.2	54.7	1.8
01/02/04	11:23:54	4.26E+00		11425.2	52.3	1.7
01/02/04	11:33:54	4.32E+00		12025.2	50.4	1.7
01/02/04	11:43:54	4.40E+00		12625.2	48.1	1.6
01/02/04	11:53:54	4.45E+00		13225.2	46.4	1.5
01/02/04	12:03:54	4.52E+00		13825.2	44.4	1.5
01/02/04	12:13:54	4.56E+00		14425.2	43.1	1.4
01/02/04	13:19:00	4.82E+00		18330.8	35.2	1.2
01/02/04	13:44:19	4.87E+00		19849.4	33.5	1.1
01/02/04	13:47:34	4.89E+00		20044.4	32.9	1.1

Bouwer & Rice Analysis for MW-1114S (FH2)

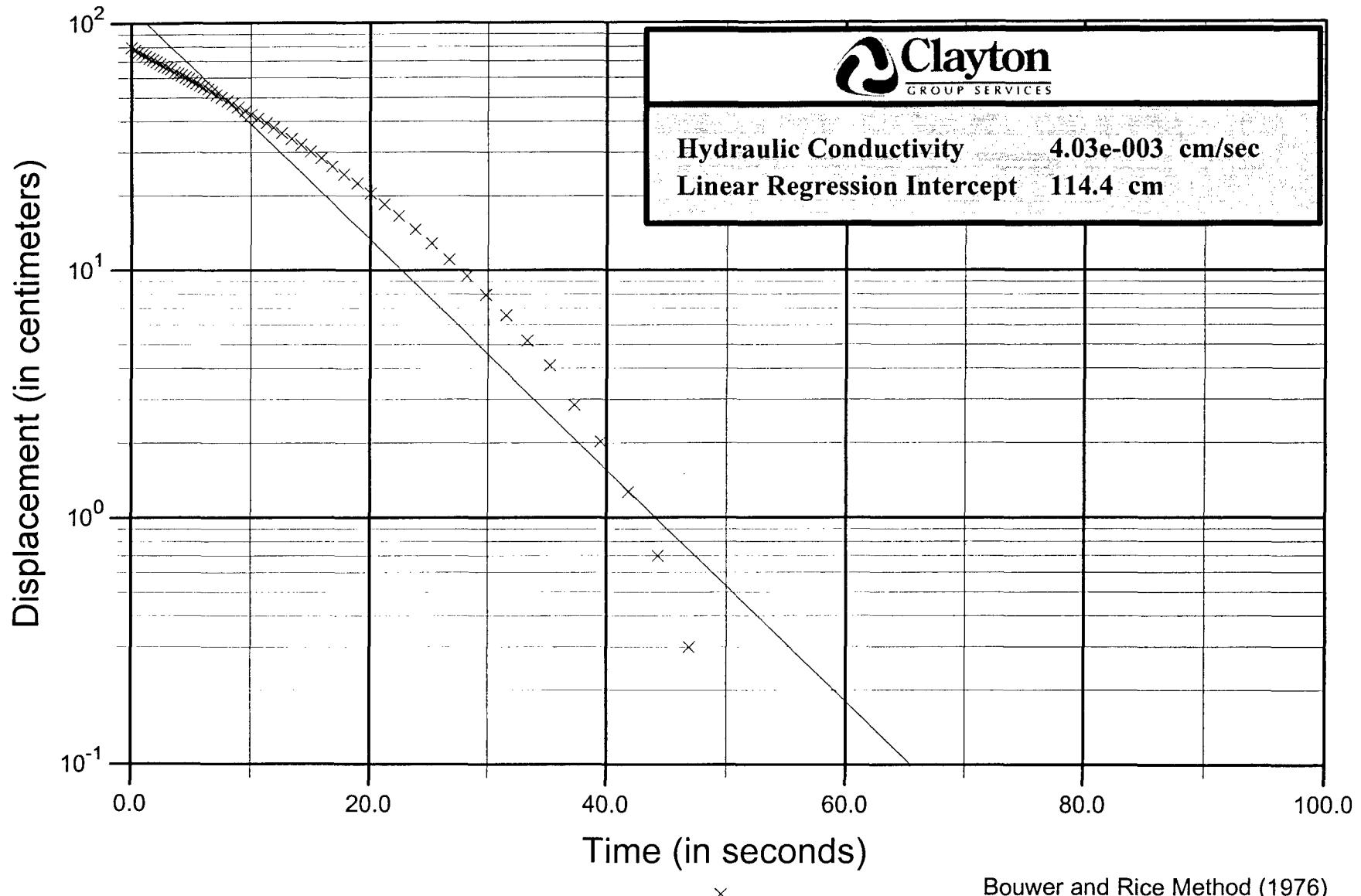


Bouwer and Rice Method (1976)

MW1114S FH2 (Plot vs. Predicted Curve)

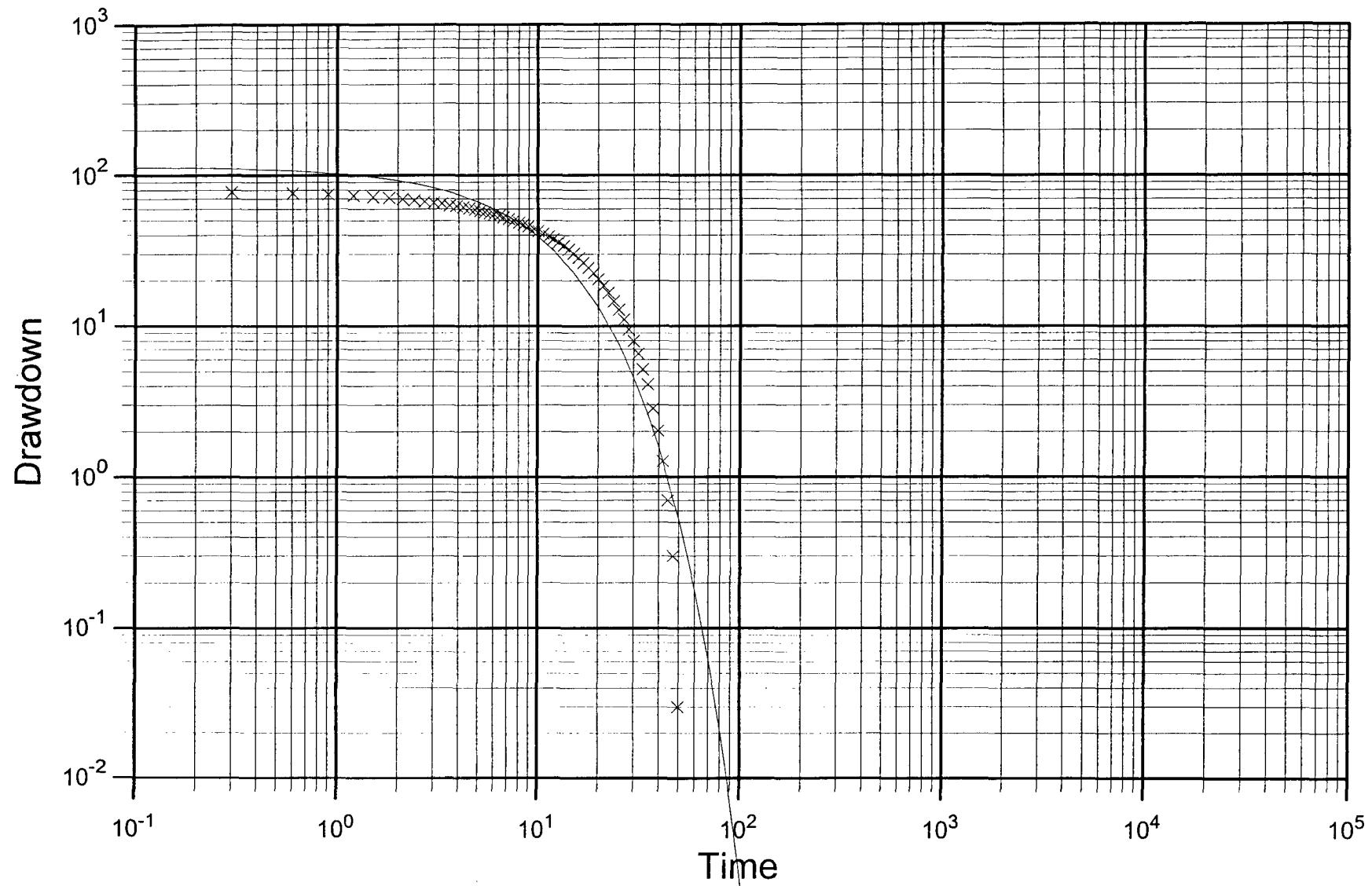


Bouwer & Rice Analysis for MW-1114S (RH2)

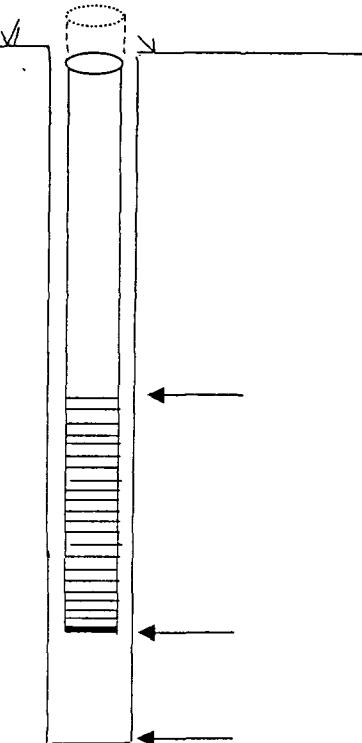
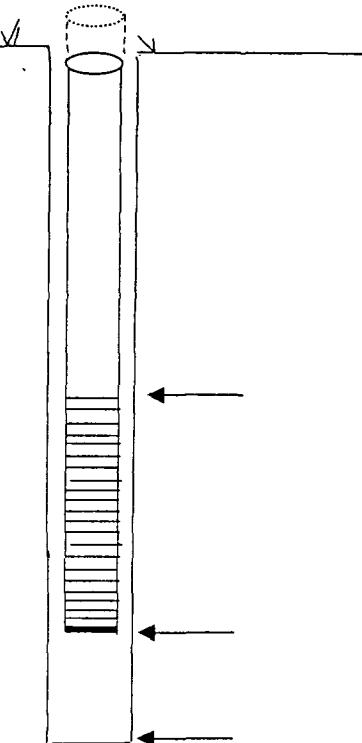


Bouwer and Rice Method (1976)

MW1114S RH2 (Plot vs. Predicted Curve)



SLUG TEST DATA FORM

PROJECT INFORMATION					ILLUSTRATION OF INFORMATION			
Project Name		Lockformer Lisle, IL			Well ID	MW-1114S		
Project No.		15-65263.60-001			Test Date	1/28/2004		
Field Personnel		D. Lamsma, R. St. John			Confined			
EQUIPMENT INFORMATION					ILLUSTRATION OF INFORMATION			
Data Logger Type / Model No.		In-Situ						
Transducer Type / Model No.		Minitroll #5914						
Slug Length / Volume		7 feet / 0.64 gallons						
GENERAL INFORMATION					ILLUSTRATION OF INFORMATION			
Static Groundwater Elevation		652.18 ft MSL						
Ground Surface Elevation		696.4 ft MSL						
Top of Casing Elevation		698.87 ft MSL						
Well Stick-up		2.47	ft	75.3				cm
Depth to Water		46.69	ft	1423.1				cm
Diameter of Well Casing		2	in	5.1				cm
Diameter of Borehole at Screen		6	in	15.2				cm
Screen Interval		50.0 - 60.0	ft BG	1524 - 1829				cm BG
Screen Length		10	ft	304.8				cm
Base of Boring		60	ft BG	1828.8				cm BG
Base of Upper Confining Unit		47	ft BG	1432.6				cm BG
Top of Lower Confining Unit		---	ft BG	0.0				cm BG
Saturated Thickness (b)		13	ft	396.2				cm
Static Height of Water in Well		13.31	ft	405.7				cm
Geology of Aquifer		Sand						
SLUG TEST MEASUREMENT INFORMATION								
Parameter		Falling Head			Rising Head			
Initial Water Level Above Transducer		12.5	ft	381	cm	12.5	ft	
Initial Drawdown/Recovery		1.96	ft	59.8	cm	2.62	ft	
SLUG TEST RESULTS								
Falling H	Rising H	Analysis Method		Parameter	Calculated Value and Units			
Notes:								

In-Situ Inc. MiniTroll Pro
 Report generated: 1/28/2004 16:25:47
 Report from file: ...\\SN05914 2004-01-28 144058 MW-1114S FH.bin
 Win-Situ Version 4.41
 Serial number: 5914
 Firmware Version 3.09
 Unit name: MiniTROLL
 Test name: MW-1114S FH
 Test defined on: 1/28/2004 14:39:56
 Test started on: 1/28/2004 14:40:58
 Test stopped on: 1/28/2004 14:59:24
 Test extracted on: N/A N/A
 Data gathered using Logarithmic testing
 Maximum time between data points: Seconds.
 Number of data samples: 111
 TOTAL DATA SAMPLES 111
 Channel number [1]
 Measurement type: Temperature
 Channel name: Temperature
 Channel number [2]
 Measurement type: Pressure
 Channel name: Pressure
 Sensor Range: 30 PSIG.
 Specific gravity: 1
 Mode: TOC
 User-defined reference: 0 Feet H2O
 Referenced on: test start
 Pressure head at reference: 18.307 Feet H2O

Date	Time	ET (sec)	Chan[1]	Chan[2]
			Fahrenheit	Feet H2O
1/28/2004	14:40:58	0	54.17	0
1/28/2004	14:40:58	0.3	54.24	-5.825
1/28/2004	14:40:59	0.6	54.26	-6.342
1/28/2004	14:40:59	0.9	54.26	-2.728
1/28/2004	14:40:59	1.2	54.26	-2.161
1/28/2004	14:41:00	1.5	54.26	2.806
1/28/2004	14:41:00	1.8	54.26	-0.01
1/28/2004	14:41:00	2.1	54.26	-0.825
1/28/2004	14:41:01	2.4	54.26	-0.877
1/28/2004	14:41:01	2.7	54.26	-0.243

1/28/2004	14:41:01	3	54.26	-0.339
1/28/2004	14:41:01	3.3	54.26	-0.291
1/28/2004	14:41:02	3.6	54.26	-0.218
1/28/2004	14:41:02	3.9	54.26	-0.116
1/28/2004	14:41:02	4.2	54.28	-0.1
1/28/2004	14:41:03	4.5	54.28	-0.035
1/28/2004	14:41:03	4.8	54.28	0.017
1/28/2004	14:41:03	5.1	54.26	0.061
1/28/2004	14:41:04	5.4	54.28	0.109
1/28/2004	14:41:04	5.7	54.28	0.161
1/28/2004	14:41:04	6	54.28	0.207
1/28/2004	14:41:05	6.4	54.28	0.261
1/28/2004	14:41:05	6.7	54.28	0.317
1/28/2004	14:41:05	7.1	54.28	0.371
1/28/2004	14:41:06	7.5	54.28	0.432
1/28/2004	14:41:06	8	54.28	0.492
1/28/2004	14:41:07	8.4	54.28	0.555
1/28/2004	14:41:07	8.9	54.28	0.74
1/28/2004	14:41:08	9.5	54.28	0.309
1/28/2004	14:41:08	10	54.24	0.887
1/28/2004	14:41:09	10.6	54.24	0.85
1/28/2004	14:41:09	11.3	54.24	1.085
1/28/2004	14:41:10	11.9	54.24	0.983
1/28/2004	14:41:11	12.6	54.24	1.047
1/28/2004	14:41:12	13.4	54.24	1.12
1/28/2004	14:41:12	14.2	54.24	1.189
1/28/2004	14:41:13	15	54.24	1.264
1/28/2004	14:41:14	15.9	54.24	1.335
1/28/2004	14:41:15	16.8	54.24	1.469
1/28/2004	14:41:16	17.8	54.24	1.473
1/28/2004	14:41:17	18.9	54.24	1.539
1/28/2004	14:41:18	20	54.24	1.6
1/28/2004	14:41:19	21.2	54.24	1.662
1/28/2004	14:41:21	22.4	54.24	1.717
1/28/2004	14:41:22	23.8	54.24	1.767
1/28/2004	14:41:23	25.2	54.24	1.811
1/28/2004	14:41:25	26.7	54.24	1.852
1/28/2004	14:41:26	28.2	54.24	1.884
1/28/2004	14:41:28	29.8	54.24	1.913
1/28/2004	14:41:30	31.5	54.24	1.936
1/28/2004	14:41:31	33.3	54.24	1.95
1/28/2004	14:41:33	35.2	54.24	1.961
1/28/2004	14:41:35	37.3	54.24	1.971
1/28/2004	14:41:38	39.5	54.24	1.973
1/28/2004	14:41:40	41.8	54.24	1.977
1/28/2004	14:41:42	44.3	54.24	1.977
1/28/2004	14:41:45	46.9	54.24	1.979
1/28/2004	14:41:48	49.7	54.24	1.979
1/28/2004	14:41:51	52.6	54.24	1.979
1/28/2004	14:41:54	55.7	54.21	1.978
1/28/2004	14:41:57	59	54.21	1.978
1/28/2004	14:42:01	62.5	54.21	1.978

1/28/2004	14:42:04	66.2	54.21	1.978
1/28/2004	14:42:08	70.1	54.21	1.978
1/28/2004	14:42:12	74.3	54.21	1.978
1/28/2004	14:42:17	78.7	54.21	1.978
1/28/2004	14:42:22	83.4	54.21	1.978
1/28/2004	14:42:27	88.4	54.21	1.976
1/28/2004	14:42:32	93.7	54.21	1.98
1/28/2004	14:42:37	99.3	54.21	1.978
1/28/2004	14:42:43	105.2	54.21	1.98
1/28/2004	14:42:50	111.5	54.19	1.98
1/28/2004	14:42:56	118.1	54.19	1.98
1/28/2004	14:43:03	125.1	54.19	1.978
1/28/2004	14:43:11	132.6	54.19	1.98
1/28/2004	14:43:19	140.5	54.19	1.976
1/28/2004	14:43:27	148.9	54.19	1.978
1/28/2004	14:43:36	157.8	54.19	1.978
1/28/2004	14:43:45	167.2	54.19	1.98
1/28/2004	14:43:55	177.2	54.19	1.978
1/28/2004	14:44:06	187.8	54.19	1.976
1/28/2004	14:44:17	199	54.19	1.978
1/28/2004	14:44:29	210.9	54.19	1.978
1/28/2004	14:44:42	223.5	54.17	1.976
1/28/2004	14:44:55	236.8	54.17	1.978
1/28/2004	14:45:09	250.9	54.17	1.976
1/28/2004	14:45:24	265.8	54.17	1.978
1/28/2004	14:45:40	281.6	54.17	1.98
1/28/2004	14:45:57	298.4	54.17	1.982
1/28/2004	14:46:14	316.2	54.17	1.989
1/28/2004	14:46:33	335	54.17	1.993
1/28/2004	14:46:53	354.9	54.17	1.98
1/28/2004	14:47:14	376	54.17	1.976
1/28/2004	14:47:37	398.4	54.17	1.98
1/28/2004	14:48:00	422.1	54.17	1.982
1/28/2004	14:48:25	447.2	54.17	1.978
1/28/2004	14:48:52	473.8	54.17	1.978
1/28/2004	14:49:20	502	54.17	1.98
1/28/2004	14:49:50	531.9	54.17	1.98
1/28/2004	14:50:22	563.5	54.17	1.978
1/28/2004	14:50:55	597	54.17	1.978
1/28/2004	14:51:31	632.5	54.17	1.976
1/28/2004	14:52:08	670.1	54.17	1.976
1/28/2004	14:52:48	709.9	54.17	1.978
1/28/2004	14:53:30	752.1	54.17	1.974
1/28/2004	14:54:15	796.8	54.17	1.976
1/28/2004	14:55:02	844.2	54.17	1.978
1/28/2004	14:55:53	894.4	54.17	1.974
1/28/2004	14:56:46	947.5	54.17	1.974
1/28/2004	14:57:42	1003.8	54.17	1.972
1/28/2004	14:58:42	1063.4	54.17	1.972

4.8	59.80
5.1	58.46
5.4	57.00
5.7	55.41
6	54.01
6.4	52.36
6.7	50.66
7.1	49.01
7.5	47.15
8	45.32
8.4	43.40
8.9	37.76
9.5	50.90
10	33.28
10.6	34.41
11.3	27.25
11.9	30.36
12.6	28.41
13.4	26.18
14.2	24.08
15	21.79
15.9	19.63
16.8	15.54
17.8	15.42
18.9	13.41
20	11.55
21.2	9.66
22.4	7.99
23.8	6.46
25.2	5.12
26.7	3.87
28.2	2.90
29.8	2.01
31.5	1.31
33.3	0.88
35.2	0.55
37.3	0.24
39.5	0.18
41.8	0.06

In-Situ Inc. MiniTroll Pro

Report generated: 1/28/2004 16:29:20
 Report from file: ...\\SN05914 2004-01-28 150150 MW-1114S RH.bin
 Win-Situ Version 4.41

Serial number: 5914
 Firmware Version 3.09
 Unit name: MiniTROLL

Test name: MW-1114S RH

Test defined on: 1/28/2004 15:01:14
 Test started on: 1/28/2004 15:01:50
 Test stopped on: 1/28/2004 15:03:37
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing
 Maximum time between data points: Seconds.
 Number of data samples: 71

TOTAL DATA SAMPLES 71

Channel number [1]
 Measurement type: Temperature
 Channel name: Temperature

Channel number [2]
 Measurement type: Pressure
 Channel name: Pressure
 Sensor Range: 30 PSIG.
 Specific gravity: 1
 Mode: TOC
 User-defined reference: 0 Feet H2O
 Referenced on: test start
 Pressure head at reference: 13.717 Feet H2O

Date	Time	ET (sec)			Data	
			Chan[1]	Chan[2]	Properly Referenced	Data (cm)
1/28/2004	15:01:50	0	54.17	0	2.64	79.94
1/28/2004	15:01:51	0.3	54.21	-0.07	2.57	77.82
1/28/2004	15:01:51	0.6	54.24	-0.114	2.526	76.49
1/28/2004	15:01:51	0.9	54.24	-0.16	2.48	75.09
1/28/2004	15:01:52	1.2	54.24	-0.205	2.435	73.73
1/28/2004	15:01:52	1.5	54.24	-0.257	2.383	72.16
1/28/2004	15:01:52	1.8	54.24	-0.291	2.349	71.13
1/28/2004	15:01:52	2.1	54.26	-0.333	2.307	69.86
1/28/2004	15:01:53	2.4	54.24	-0.376	2.264	68.55
1/28/2004	15:01:53	2.7	54.26	-0.418	2.222	67.28

1/28/2004	15:01:53	3	54.26	-0.452	2.188	66.25
1/28/2004	15:01:54	3.3	54.26	-0.481	2.159	65.37
1/28/2004	15:01:54	3.6	54.26	-0.554	2.086	63.16
1/28/2004	15:01:54	3.9	54.26	-0.572	2.068	62.62
1/28/2004	15:01:55	4.2	54.26	-0.602	2.038	61.71
1/28/2004	15:01:55	4.5	54.26	-0.641	1.999	60.53
1/28/2004	15:01:55	4.8	54.26	-0.675	1.965	59.50
1/28/2004	15:01:55	5.1	54.26	-0.714	1.926	58.32
1/28/2004	15:01:56	5.4	54.26	-0.75	1.89	57.23
1/28/2004	15:01:56	5.7	54.26	-0.783	1.857	56.23
1/28/2004	15:01:56	6	54.26	-0.818	1.822	55.17
1/28/2004	15:01:57	6.4	54.26	-0.852	1.788	54.14
1/28/2004	15:01:57	6.7	54.26	-0.898	1.742	52.75
1/28/2004	15:01:58	7.1	54.26	-0.943	1.697	51.39
1/28/2004	15:01:58	7.5	54.26	-0.987	1.653	50.05
1/28/2004	15:01:58	8	54.28	-1.034	1.606	48.63
1/28/2004	15:01:59	8.4	54.26	-1.083	1.557	47.15
1/28/2004	15:01:59	8.9	54.28	-1.127	1.513	45.81
1/28/2004	15:02:00	9.5	54.28	-1.182	1.458	44.15
1/28/2004	15:02:00	10	54.24	-1.229	1.411	42.73
1/28/2004	15:02:01	10.6	54.24	-1.281	1.359	41.15
1/28/2004	15:02:02	11.3	54.24	-1.339	1.301	39.39
1/28/2004	15:02:02	11.9	54.24	-1.393	1.247	37.76
1/28/2004	15:02:03	12.6	54.24	-1.452	1.188	35.97
1/28/2004	15:02:04	13.4	54.24	-1.514	1.126	34.10
1/28/2004	15:02:05	14.2	54.24	-1.575	1.065	32.25
1/28/2004	15:02:05	15	54.24	-1.639	1.001	30.31
1/28/2004	15:02:06	15.9	54.24	-1.7	0.94	28.46
1/28/2004	15:02:07	16.8	54.24	-1.769	0.871	26.37
1/28/2004	15:02:08	17.8	54.24	-1.833	0.807	24.44
1/28/2004	15:02:09	18.9	54.21	-1.897	0.743	22.50
1/28/2004	15:02:10	20	54.24	-1.962	0.678	20.53
1/28/2004	15:02:12	21.2	54.24	-2.027	0.613	18.56
1/28/2004	15:02:13	22.4	54.24	-2.09	0.55	16.65
1/28/2004	15:02:14	23.8	54.24	-2.156	0.484	14.66
1/28/2004	15:02:16	25.2	54.24	-2.215	0.425	12.87
1/28/2004	15:02:17	26.7	54.24	-2.275	0.365	11.05
1/28/2004	15:02:19	28.2	54.24	-2.327	0.313	9.48
1/28/2004	15:02:20	29.8	54.24	-2.377	0.263	7.96
1/28/2004	15:02:22	31.5	54.24	-2.423	0.217	6.57
1/28/2004	15:02:24	33.3	54.24	-2.469	0.171	5.18
1/28/2004	15:02:26	35.2	54.24	-2.504	0.136	4.12
1/28/2004	15:02:28	37.3	54.24	-2.546	0.094	2.85
1/28/2004	15:02:30	39.5	54.24	-2.573	0.067	2.03
1/28/2004	15:02:32	41.8	54.21	-2.598	0.042	1.27
1/28/2004	15:02:35	44.3	54.24	-2.617	0.023	0.70
1/28/2004	15:02:37	46.9	54.24	-2.63	0.01	0.30
1/28/2004	15:02:40	49.7	54.21	-2.639	0.001	0.03
1/28/2004	15:02:43	52.6	54.21	-2.64	0	0.00
1/28/2004	15:02:46	55.7	54.21	-2.64		
1/28/2004	15:02:49	59	54.21	-2.642		
1/28/2004	15:02:53	62.5	54.21	-2.642		

1/28/2004	15:02:57	66.2	54.21	-2.64
1/28/2004	15:03:00	70.1	54.21	-2.64
1/28/2004	15:03:05	74.3	54.21	-2.642
1/28/2004	15:03:09	78.7	54.21	-2.64
1/28/2004	15:03:14	83.4	54.21	-2.639
1/28/2004	15:03:19	88.4	54.21	-2.639
1/28/2004	15:03:24	93.7	54.21	-2.639
1/28/2004	15:03:30	99.3	54.21	-2.637
1/28/2004	15:03:36	105.2	54.21	-2.635

0	79.94
0.3	77.82
0.6	76.49
0.9	75.09
1.2	73.73
1.5	72.16
1.8	71.13
2.1	69.86
2.4	68.55
2.7	67.28
3	66.25
3.3	65.37
3.6	63.16
3.9	62.62
4.2	61.71
4.5	60.53
4.8	59.50
5.1	58.32
5.4	57.23
5.7	56.23
6	55.17
6.4	54.14
6.7	52.75
7.1	51.39
7.5	50.05
8	48.63
8.4	47.15
8.9	45.81
9.5	44.15
10	42.73
10.6	41.15
11.3	39.39
11.9	37.76
12.6	35.97
13.4	34.10
14.2	32.25
15	30.31
15.9	28.46
16.8	26.37
17.8	24.44
18.9	22.50
20	20.53
21.2	18.56
22.4	16.65
23.8	14.66
25.2	12.87
26.7	11.05
28.2	9.48
29.8	7.96
31.5	6.57
33.3	5.18
35.2	4.12

37.3	2.85
39.5	2.03
41.8	1.27
44.3	0.70
46.9	0.30
49.7	0.03
52.6	0.00